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No. 2203

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United States  
Circuit Court of Appeals  
For the Ninth Circuit.

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Transcript of Record.  
(IN THREE VOLUMES)

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MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Appellants,  
vs.

SAN FRANCISCO CHEMICAL COMPANY,  
a Corporation,  
Appellee.

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VOLUME II.  
(Pages 305 to 592, Inclusive.)

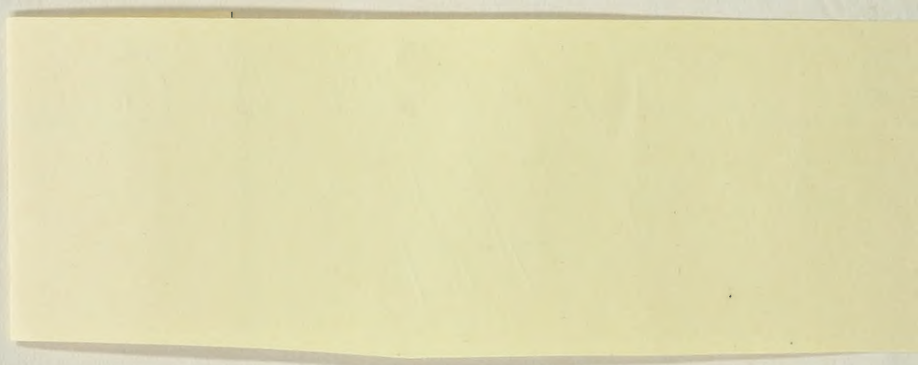
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Upon Appeal from the United States District Court for  
the District of Idaho, Southern Division.

FILED

DEC 30 1912

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(Testimony of Guy Sterling.)

Q. How is that spelled? A. R-e-m-s-e-n.

Q. Any others?

A. I don't remember any others in particular now, although there are others.

Q. You are sure of that?

A. Quite sure of it, because I remember a number of different chemical books. It is too trifling to mention some of it, of the small investigations [347] in the matter.

Q. As to your work in the field, making examinations of phosphate rock, where and when did you first begin the examination of phosphate rock in the field?

A. On the Bradley lode, in and on what is called the Crawford Mountain District, east of Randolph.

Q. When was that?

A. As I say, I think it was in 1906.

Q. All right. Tell us what you did out there.

A. In the first place you want the geological part of it? You don't care anything about anything else?

Q. I don't care anything about what you done surveying.

A. I went simply through and examined the claims and noted the different workings, practically on the same line of testimony I have given here in regard to this group of claims shown on Exhibit No. 1; examined the rock and took the different strikes there and noted the formation, the width and thicknesses of the vein—dip and strike of the veins, and determined whether the rock was in place, and made

(Testimony of Guy Sterling.)

a report to the Government about it.

Q. Now, coming back to your examination. What did you do while you were upon the ground, by way of a detailed examination of this rock?

A. I took the dip and strike of the veins.

Q. I mean as to the characteristics of the rock itself.

A. I took samples of the rock, and tested them qualitatively myself, and then had them tested quantitatively by Officer & Co., to determine whether they were limestone or phosphate rock, and also to determine by Officer & Co. the percentage of [348] calcium phosphate the samples contained.

Q. You did not assist in that test?

A. I did not assist Officer & Co. in that, but I did, as I have said, I made my own independent examinations to determine as to whether phosphate or not.

Q. Where? On the ground?

A. Took the samples to my office, and did the work there.

Q. Now, how long were you there studying these Bradley lode claims?

A. Well, I suppose I was off and on there on that particular branch of the work, I should say probably about two weeks.

Q. Two weeks?

A. But, of course, I was on the ground, you understand, a month or probably six weeks altogether, but this two weeks' work was for the particular purpose of this geological, or we will say this mineral report, and those two weeks' work there was a sort of a



(Testimony of Guy Sterling.)

concentration of all the observations that I had tried to make while I was making my surveys of the ground and workings and the formation, to the end of it, so that it would be absurd to say that the two weeks' work was the only time that was devoted to gaining the knowledge that I used in making these reports.

Q. I see. How long after you made that examination in the Crawford Mountains did you make the report?

A. As I remember it, I made it immediately as soon as I got through with the field work.

Q. Now, when you were up making these examinations, did you at that time have any interest in phosphate claims yourself?

A. Yes; I had an interest. I don't wish to be anything except perfectly frank about that matter. I had an interest [349] in some claims, but I will not be positive now that I had that interest before or after I made these examinations. My impression is now that I did not have that interest in those claims until after I had finished that examination.

Q. Where were the claims in which you had an interest?

A. They were a continuation to the south of the Bradley group, and are east of the claims of Jeffs and Duffield, which lie in the Crawford Mountain district.

Q. But on this same deposit?

A. Part of this same formation?

Q. Yes. A. Yes, sir.

(Testimony of Guy Sterling.)

Q. Now, did you look at those claims?

A. I made a survey of some of them for Thure Crownholm.

Q. You made the surveys for him?

A. For him, and he located them.

Q. He located them? A. Yes, sir.

Q. And it was in these claims you had interests?

A. Yes, sir.

Q. Do you know whether that survey was before or after you went out to make the examination of the Crawford Mountain country?

A. Repeat that question.

Q. Did you make this survey for this man, whose name I cannot repeat, before you made the examination upon which you based the government report?

A. No; as I say, it brings up the same matter that you spoke of before, but I think my impression is that I surveyed those claims for Crownholm subsequent to my examination for these government reports.

Q. How long subsequent?

A. I don't think it was very long, probably was not more than two or three months, and it might possibly have been before. [350]

Q. It might have been? A. Yes, sir.

Q. You are not sure now whether or not it was before? A. No; I am not sure about that now.

Q. And at the time you made this government report, from which you read on yesterday, you had this interest in those claims?

A. I say I don't know; I am not sure about it. It

(Testimony of Guy Sterling.)

may have been and may not.

Q. The report was made, of course, after the examination was made out there?

A. Yes, sir; but my interest may not have occurred until I made the report and until after I made the examination. It might have been before then, for all I know.

Q. You have no distinct recollection?

A. I don't remember now. I can look it up and determine absolutely about that.

Q. Will you do that? A. Surely.

Q. All right. At the time you made this examination for the Bradley Brothers, did you have any prospective interest in phosphate rock, that you know of—have you any distinct recollection of having any prospective interest in phosphate claims?

A. I would like to know what is meant by prospective.

Q. Well, did you have any agreement or understanding with any of the parties, that you should become a part owner or interested in any claims of phosphate rock? A. No.

Q. You had none, unless it was—

A. Unless it was as I say.

Q. Unless in these claims?

A. Unless I had acquired that before.

Q. Now, who sent you out to make this report, or this examination? [351]

A. I received an order from the Surveyor General to do it.

Q. Of Utah? A. Yes, sir.



(Testimony of Guy Sterling.)

Q. And you were at that time a Deputy Mineral Surveyor? A. Yes, sir.

Q. And have been since? A. Yes, sir.

Q. And at this time you are a Deputy Mineral Surveyor? A. Yes, sir.

Q. There has been no time intervening when you have not been? A. No.

Q. All right. Now, going a little further, what other studies of phosphate rock did you make after, in addition to the Bradley lode claim?

A. None other, except the examination that I have made for Jeffs and Duffield.

Q. In 1910? A. 1910, yes, sir.

Q. And on how many occasions did you visit this particular territory where these claims were located?

A. I went up, as I said in my testimony, October 29, October 30, and November 15, I think it was, of 1910.

Q. Well, November 15th was the Wyoming claims?

A. Yes, sir.

Q. So that two days is the only time that you spent on the Montpelier group of claims, was it?

A. That is the only time I spent in the field on it.

Q. That is what I say; and of course that covered the extent of your examination of it?

A. No; I could not spend any more time there to any advantage; if I could why I would have done it.

Q. On the Thomas Fork claims you spent how long? I mean by that those shown on Exhibits "A" and "B."

A. As I say, I think we were there one day.

(Testimony of Guy Sterling.)

Q. Did you make any chemical analysis of any of this phosphate [352] rock taken from these claims?

A. Not personally.

Q. That is, either in Idaho or Wyoming.

A. Not personally.

Q. When you went over these claims did you take any measurements as to the extent of the deposits?

A. Yes, sir; I think I remember distinctly of measuring the thickness of the vein in several places. I remember distinctly of doing that, I think, in the Obey lode, and probably did it in a number of others. I had a tape-line along, and I measured wherever I wanted to be very exact. Where I did not, where it did not seem of particular importance whether the vein was 4 feet thick or 6 feet thick, I probably estimated with my eye.

Q. In making these measurements you are speaking of now of having measured, it was simply the bed?

A. The individual bed of phosphate rock, or the individual wall.

Q. Yes. In other words, you did not make any measurements of the balance of the series?

A. No; there was no place I could do that, because it was not well enough uncovered anywhere to make it certain.

Q. At no place on the lode?

A. Not in that group, as I remember it.

Q. Did you make any search to find a place where you could examine and measure the width of the various strata throughout this series?

(Testimony of Guy Sterling.)

A. Well, I did not—well, I had that in mind to do that, make that examination, if there was a good opportunity to do it, and if there had been a good opportunity to do it I would have done it.

Q. Have you in mind any search of that kind in your examination?

A. No more than making an examination of the whole thing, [353] in trying to see and observe everything there was pertaining to the subject.

Q. Did you take any cross-sections of the series?

A. Only such as were readily obtained in the workings.

Q. That was simply of one bed?

A. That particular working upon and across that bed, and in some places it cut it, but how much particularly I have forgotten now. I think I mentioned in my testimony that there was several places where two or three beds were cross-cut by the tunnels.

Q. Did you take cross-sections where they were cross-cut?

A. As I said, some of them were measured carefully. I remember particularly I think in the Obey lode, but generally though I would estimate with my eye the general thickness, and counted the number of beds that appeared to have been cut, and that was all.

Q. Did you make any maps or illustrations?

A. I remember of doing that I think on the Obey lode, and probably on some of the others, and wherever—

Q. Probably. Don't you remember whether you did or not?



(Testimony of Guy Sterling.)

A. No, I do not. I can look in my notes and see, if you like.

Q. Yes; I would like to know.

A. I have a little cross-section here taken of cut No. 5, looking southerly.

Q. Where is that? A. That is on the Obey lode.

Q. All right. Any others?

A. I have another one here at cut No. 8.

Q. Is it an illustration, or simply a notation of what you found?

A. I will show you, if you care to look at it. It says here, [354] cut No. 5 looking southerly; that is the surface, and this is going in the cut with the tunnel, and there it says "face," and there marked "phosphate rock," "lime," and "lime" again.

Q. That illustration is merely a rough sketch that you drew out with a pencil, without regard to any measurements? A. Yes, sir; it is measured.

Q. And drawn to a scale?

A. It is not drawn to a scale, but the measurements are given, and I have got in my notes the size of that, or estimated the size of that cut.

Q. Give us the measurements.

A. I could draw it off if necessary, make a very approximate drawing to a scale, if necessary.

Q. Give us the measurements of the different strata.

A. I have got estimated here, or stated, in the face of the cut limestone, and then I have a bed of limestone 5 feet thick.

Q. Limestone first, and then a bed of limestone?

A. No; the face was phosphate rock.

(Testimony of Guy Sterling.)

Q. And then a bed of limestone 5 feet thick?

A. And then a bed of phosphate 5 feet thick, and then a bed of limestone which in thickness was not completely shown. I only say cut in there, and I have not got the thickness of that.

Q. How thick was it, as far as you measured it?

A. I can't tell you.

Q. You did not measure?

A. I did not measure that, because I was going to try to get the thickness of these beds clearly shown.

Q. Now, have you made any other examinations upon the ground of [355] phosphate rock, other than what you have stated?

A. Have I made any other examinations of phosphate rock?

Q. On the ground? A. This ground?

Q. Any ground in the west, and if so where and when?

A. Well, just to be complete, probably of no particular importance, I examined west from that ground that deposit that crops out of west Duffield and Jeffs' ground in the Crawford Mountains.

Q. Well, when was that? At the time you made—

A. Well, that was after, I think, I made these surveys for Crownholm that I mentioned at that time.

Q. That same time, the same visit?

A. Oh, no, a different visit.

Q. Did you go out there for the purpose of making a study of the phosphates at that time?

A. I went out there to look over the ground. Of course that would be a study of phosphates so far

(Testimony of Guy Sterling.)

as it occurred in the field.

Q. Did you go out to study that, or go out to survey?

A. I went to look over the ground, to see what the deposit amounted to, how large it was, and the quality it appeared to be, etc.

Q. Any other examinations on the ground?

A. I don't remember of any other.

Q. Now, Mr. Sterling, calling your attention to this deposit, what do you call that deposit?

A. Deposit of rock.

Q. Is that the only name you give it? A. No.

Q. What is it? What do you call it?

A. I call it a deposit of calcium phosphate.

Q. You used the term phosphorite in your direct examination. [356] Is it phosphorite?

A. I think that is the proper name for it. You understand that these are hair splitting distinctions. You can call it phosphorite, if you want to, and if you don't want to you don't have to.

Q. I am asking you what you call it.

A. I think it is proper to call it a phosphorite.

Q. What is phosphorite?

A. Calcium phosphate.

Q. Is that the only definition you can give of calcium phosphate?

A. It generally implies *to in* uncrystallized form of calcium phosphate.

Q. Can you give the constituents? A. Yes.

Q. What are they?

A. That I can give you, my idea of phosphorite.

Q. I am asking you if you can give me the consti-

(Testimony of Guy Sterling.)

tuents of phosphorite.

A. My definition of phosphorite would be uncrystallized calcium phosphate.

Q. I am not asking you that.

A. Calcium phosphate is a chemical combination of phosphorus, oxygen and calcium.

Q. Is that all that is necessary to constitute phosphorite? A. I think that is enough.

Q. I am not asking you if enough, but I am asking you the constituents of it.

A. I think it is enough. It might have impurities in it; it might have lime in it, and it might have alumina in it, and it might have silica in it, and might have free lime in it, but I think it would be in either case a phosphorite.

Q. Don't you know that phosphorite must contain—don't you know that phosphorite, that one of the constituents of phosphorite [357] is chlorine?

A. It may be, but I don't think it is absolutely essential.

Q. I am asking you as a geologist.

A. I don't know that it is absolutely necessary.

Q. Don't you know that the texture of phosphorite must be fibrous?

A. No; I think not. I think that it may or may not be fibrous. I think you could use the term phosphorite without regard to any hair splitting distinctions like that.

Q. Don't you know that phosphorite must have a certain density, or gravity, a given density and a given gravity?



(Testimony of Guy Sterling.)

A. I don't think so, in a general way.

Q. I am not asking you in a general way, but as a geologist.

A. I don't think so as a geologist, in a general way.

Q. What do you mean by that?

A. I mean exactly what I say.

Q. What do you mean by a general way?

A. I mean all of these things cannot be—these distinctions cannot be applied in such a hair splitting and definite way as your questions would imply.

Q. That is your opinion of it. I am asking you certain questions, and I want, if you can to give me answers to them. I ask you whether or not it is not essential, from a geological standpoint, for the substance to be phosphorite, that it have a given density or gravity?

A. No, I think not. I think it could vary.

Q. Isn't it necessary, for the substance to be phosphorite, that it have a lustre, a given lustre?

A. I think not. I think that could vary.

Q. What do you call apatite, Mr. Sterling? [358]

A. That I would consider the crystallized form of calcium phosphate, where it occurs in nature.

Q. How is it distinguished from phosphorite?

A. Well, it is crystallized. It has a definite, generally a definite form, a crystalline form, and apatite generally does contain other things besides calcium phosphate.

Q. You think it does?

A. I think, as a rule, it does.

(Testimony of Guy Sterling.)

Q. This calcium phosphate contains other things, too?

A. Yes, sir; this is not pure calcium phosphate, by any means.

Q. Is the only distinction between apatite and phosphorite, that the apatite is crystalline?

A. No.

Q. What other?

A. No. I think that is the main difference, but apatite generally contains, I believe, some fluorine in combination, in chemical combination with the calcium phosphate.

Q. Now, coming again to the question of these deposits. You read in your report, which you made to the Department, that the veins of this phosphate rock lie in the same general way as veins of valuable and metallic mineral in the Rocky Mountains and Pacific Coast region?

A. I don't think I read that, Mr. Budge.

Q. I think you did. You can look at your report and see if it is not in that.

A. If I may be allowed to explain, if you have got one of them, does that apply to the Lorine lode location there?

Q. It is a Government document, is all I know about it. It is a pamphlet published at the Government printing office. [359]

A. I made a number of reports, and that is one of them. I don't think the one you have is the one, unless it says Lorine lode location.

Q. Yes. Mineral Entry 3093, Lorine lode.

(Testimony of Guy Sterling.)

A. I don't think I read that statement, which you read there, although it is undoubtedly in this report.

Q. I think you did.

A. If it says it there, it is correct. Will you read what is in that report?

Q. "The veins of this territory lie in the same general way to those of valuable metallic minerals in the Rocky Mountains and Pacific Coast region."

A. You might read a little more before and after that. I can't locate that here.

Q. That is the beginning of the whole paragraph. I might read the whole paragraph, but I will ask you just whether that is a part of the report that you made, or whether that is your idea of those deposits.

A. I am not able to find that statement in here at all.

Q. Have you the Lorine lode report there?

A. This is the Lorine lode report.

Q. If it is not there we will go into another feature.

A. You had better go into some other matter.

Q. I will call attention to something else apart from that.

A. I don't think that is in the Lorine report, that sentence that you read.

Mr. DEY.—What are you reading from?

Mr. BUDGE.—I am reading from the report of the phosphate land hearings before the Committee on Public Lands, in the House of Representatives in 1909. [360]

Q. You say here in this report—I will ask you if

(Testimony of Guy Sterling.)

you made this statement in your report:

“The existence of the veins of phosphate rock may be accounted for by supposing that a bed of limestone originally occupied the position of one of the veins of phosphate rock, and that the bed of limestone was covered, while in its original horizontal position, with a bed of animal and vegetable remains, shells, excrement, and other material containing free phosphoric acid and soluble phosphates.” Is that right?

A. Yes.

Q. You made that?

A. Yes, sir; I have that here.

Q. “Water percolating from above through this mass carried the phosphoric acid and soluble phosphates down to the underlying bed of limestone. By the contact of the phosphoric acid and the soluble phosphates with the limestone, chemical action was brought about, resulting in the formation of a bed of calcic phosphate, where originally was a bed of limestone. In the course of time other beds of limestone and calcic phosphate were successively and alternately deposited one above the other through the entire series of veins.” Is that right?

A. That is right.

Q. Now, calling your attention to this particular paragraph, I will ask you to explain what your idea is as to this phosphate being collected, or phosphate rock being collected. Give it a little more in detail than given in this paragraph.

A. I don't believe I can very well. That explains



(Testimony of Guy Sterling.)

it as well as I know how, and in detail as much as I can do so.

Q. Let me ask you this, then; You say that there was percolating [361] waters from above through this mass, that is, from the vegetable remains, shells and excrements, and so on, which carried phosphoric acid and soluble phosphates down to the underlying bed of limestone, and by contact with the phosphoric acid and soluble phosphates with the limestone, chemical action was brought about? A. Yes, sir.

Q. What chemical action would be brought about?

A. Well, the phosphoric acid, as the name implies, is an acid, and the underlying bed being, for instance, a bed of limestone, mud or marl, of course, when the acid came in contact with the lime it would act upon the lime and it would have a chemical reaction.

Q. There would be a chemical reaction from the contact of the phosphoric acid with the limestone?

A. Yes, sir.

Q. There would? A. Yes, sir; I think so.

Q. Tell us what it is.

A. Why, limestone is carbonate of lime.

Q. Yes.

A. And the carbonic acid gas would be set free, and the acid phosphate would take its place in combination with the lime.

Q. What set the carbonic acid gas free?

A. Why, the action of the acid on the carbonate of lime.

Q. On the carbonate of lime? It would have that effect? A. Yes.

(Testimony of Guy Sterling.)

Q. Is that all that is necessary to set the carbonic acid gas free, simply to put phosphoric acid in contact with limestone?

A. I think so, if they were, yes; that is my understanding of it. [362]

Q. In other words, if you take a piece of limestone and put it in contact with that phosphoric acid, the carbonic acid gas would be liberated, would it?

A. I think so.

Q. That is your understanding as a chemist?

A. That is my understanding of it.

Q. As a chemist?

A. It might be necessary with the water, to have in addition the phosphoric acid in it, perhaps some carbonic acid to make the limestone a little more soluble.

Q. Would it be necessary?

A. Probably, to get such wholesale results as we get here, it would be necessary.

Q. It would be necessary?

A. Yes, sir; it could easily occur.

Q. Now, is it your idea, according to this paragraph, and do you intend that you shall be understood as saying that this calcium phosphate, as it is found in this region, was at one time a limestone bed?

A. A part of it was.

Q. Was it?     A. I say a part of it.

Q. Was the area covered by this particular deposit, the zone of this particular one, or one of these particular beds of calcic phosphate, was that at one time limestone?

(Testimony of Guy Sterling.)

A. Oh, I would not say that positively, because that would be a pure matter of theory; all that I know or I pretend to know is—I don't pretend to know that—it is purely a matter of theory, I think. Or, in other words, it seems possible and probable that that deposit of calcium phosphate took place in some such manner as I have described here, but I do not say that is absolutely so.

Q. And then your idea is that there was a leaching of this [363] phosphoric acid from the phosphate deposit, or the deposit of phosphatic matter, there was a leaching from that bed down into the lower bed of limestone?

A. Yes, sir; that seems probable.

Q. Do you think that that is a reasonable solution, in view of the fact that—in view of the uniformity of this bed? A. Yes, sir.

Q. Of calcic phosphate? A. Yes, sir.

Q. How do you explain it? Isn't it true such a leaching usually leaves it irregular?

A. No; it depends on the physical forces that were at work there, as well as chemical forces, and how long a time it was going on.

Q. It might have been for a million years, for all anybody knows and can determine now?

A. There is no objection to the theory that I gave in that report, due to the fact that the bed lies in even and uniform form.

Q. Well, I will ask you particularly as to the uniformity of the quality of the grade in some particular places, we will say. If one of these beds of phosphate rock or calcium phosphate at some par-

(Testimony of Guy Sterling.)

ticular point, where we will say the vein is 5 feet in thickness— A. Yes.

Q. Now, it is true, isn't it, that the quality of that calcium phosphate, the percentage in it is practically the same in that particular place throughout?

A. It is in many veins there very uniform in grade.

Q. Isn't it true, taking any vein, a cross section of any vein of this phosphatic rock at any particular part, it would be uniform in quality throughout that vein? Isn't that generally [364] the condition throughout that?

A. That general condition is true, but you must remember that some of these veins look 4 or 5 feet thick, and close examination will show that they are split up into two or three thinner veins, although the walls may be very thin.

Q. But irrespective of the thickness of the vein, whatever it may be, taking a cross section of the vein itself, what you call the vein of phosphate rock, the quality of the vein is practically the same throughout?

A. Yes, sir; that is pretty uniform in grade.

Q. Now, then, in view of that uniformity of grade, do you consider that this leaching process is the manner in which that phosphatic bed was laid down?

A. I do not see anything inconsistent with that, because, as I said, there were physical conditions there that we know nothing about; the time elements we know nothing about, and we don't know whether this is a beach that gradually receded, or whether it was the bottom of a sea and deposited in that way, or whether it was a beach that extended out into the



(Testimony of Guy Sterling.)

ocean. We do not know any of those conditions, and I see nothing in the fact that the quality of the rock is uniform between the walls of any individual vein, to lead me to think that there is anything particularly unreasonable in that theory.

Q. Well, now, if your idea is that this calcium phosphate bed, one of these calcium phosphate beds was formed, was at one time a limestone bed, and that from above by a leaching process, the phosphoric acid and soluble phosphates came down into this bed of limestone, is it reasonable to suppose—I am [365] asking you as a geologist—is it reasonable to suppose by this leaching process the limestone rock would be impregnated with the phosphatic material in the same degree and with the same uniformity as it is found in one of these beds?

A. I don't think I have stated that it was a bed of limestone rock; I said of marl or limestone mud, some soft material that the acid would have a better chance to act on.

Q. Let me read to you.

A. If I have given unqualifiedly the opinion or statement in there that there was a bed of hard, solid limestone lying under this acid, that was not my intention.

Q. If you have given the idea, it was a hard bed of limestone, then your leaching process idea would not be well founded?

A. It would not be applicable to the extent I have stated. I am satisfied, and I know that I stated in there, or given the explanation rather of the rock becoming consolidated afterwards, showing I did not

(Testimony of Guy Sterling.)

consider it was a solid bed of limestone at the time this chemical action took place.

Q. You have stated the way the existence of the veins of phosphate rock may be accounted for, by supposing that the bed of limestone originally occupied the position of one of the veins of phosphate rock. That is correct, isn't it?

A. Yes; but that is not saying that the limestone is solid and hard.

Q. And it is not saying that it is soft either?

A. Well, I imply that afterwards.

Q. Where?

A. I say in the next paragraph: "Consolidation and concentration of the beds of [366] calcic phosphate thus formed were brought about by the pressure of subsequently deposited formation." That does not change the condition of concentration of the beds of calcic phosphate thus formed. Now, you can't have consolidated a thing already solid, can you?

Q. I am asking you. You say here in the next paragraph: "Consolidation and concentration of the beds of calcic phosphate thus formed—" Now, I am trying to get at the manner of their formation.

A. I will explain it. I say again it was not my idea, and while it may not be explained elaborately there, it must be assumed that the limestone was probably in a condition so that it was easy of attack by the phosphoric acid.

Q. In other words, your idea is then it was a soft bed of limestone?

A. Probably a soft bed of limestone in the shape

(Testimony of Guy Sterling.)

of what we call marl now, practically a limestone mud.

Q. A limestone mud?

A. Yes, sir; it was if wet.

Q. And it was wet, you say?

A. If it were wet it would be a mud.

Q. That is quite true; if it were wet it would be a mud. Now, Mr. Sterling, what evidences in the field from the examination of these phosphate deposits that you have made, what evidence have you, and what did you see and observe on these deposits to indicate that there was a leaching process?

A. I did not see anything there in the field.

Q. There is not any physical evidences, so far as you now can remember, by which you can justify a leaching process?

A. I don't remember of seeing anything in the field. [367]

Q. That, as you say, would lead to or show any indication of a leaching process.

A. I do not mean to say by that that there are not any, but I say I have not seen any or noticed any.

Q. Now, you have testified, I think, or it appears in your report that this calcium phosphate is oolitic in character. Is that correct?

A. Yes, sir; the phosphate rock is oolitic.

Q. Now, let me ask you in your judgment as a geologist, if it could be oolitic as it is found, and have been established by a leaching process?

A. Well, it could be oolitic in connection with this theory of the deposition, that which I give in my report, because I think that oolitic form is, at least

(Testimony of Guy Sterling.)

I should suppose that the oolitic form is due to the calcium phosphate being in a finely divided and rather a loose condition, being mixed up with little fragments of perhaps organic matter, or little particles of shell, and being rolled around and moved in and out and up and down by a wave action, would have a tendency to bring it to this oolitic form.

Q. In other words, the oolites are formed, are they not, from a washing process?

A. I can imagine that, or from a wave action.

Q. Isn't that pretty generally understood among geologists, that oolites are the result of a washing process, wave action, or some other—or water movement?

A. I think that is all right. It is a good theory, reasonable. [368]

Q. Isn't it established?

A. I don't think that it is anything that is established. I don't know of anybody that has seen anything of oolites being made or in course of formation now.

Q. In other words, it is beyond dispute, so far as geologists are concerned, that that is the manner in which oolites are formed?

A. Oh, I don't think there is any controversy about it.

Q. Now, then, your idea as I gather it, and I want to understand the paragraph that you have referred to, your idea is, when this leaching process was going on, that the phosphate or the phosphoric acid was in solution? A. Yes, sir.



(Testimony of Guy Sterling.)

Q. Now then, if that were in solution and transmitted in solution down to the other underlying bed of limestone, as you have stated, could it be in its present form oolitic?

A. If the underlying bed of limestone was soft and muddy.

Q. Do you mean to say that the soluble phosphate, or the phosphoric acid in solution could go down in the bed of limestone, and after it got down there make oolites?

A. It could if it was soft and the water receded so as to bring it down to an evenly exposed beach there of limestone mud and phosphoric acid together, mixed up with organic remains, etc.

Q. But where was this layer of shells and excrement and phosphatic material?

A. That might have gone down from the inland waters, with the water.

Q. It was above the limestone, according to this report, was it not?

A. It was above it at one time. It might have been deposited in very fine layers on it, and it might possibly [369] have come along at the same time with the lime. This theory in the report is merely a theory.

Q. Merely a theory?

A. I don't say the only theory, and I don't say that it is an absolutely correct theory.

Q. What I want to get at is whether or not your idea of this situation was not this, that there was a bed of limestone, and which you afterward stated was a soft bed, and above that was a layer or deposit

(Testimony of Guy Sterling.)

of phosphatic material, such as excrements, shells, bones, and so on. That is correct, isn't it?

A. Yes, sir; that is correct enough.

Q. And in respect to that further, that the water percolating through this mass of phosphatic material carried the phosphoric acid in solution and the soluble phosphates in solution, down to this underlying bed of limestone. Is that correct?

A. Yes, sir.

Q. Now, then, after this had been going on for an unknown period, this underlying bed of limestone, by the impregnation of the soluble phosphates and phosphoric acid, came to be the bed which is now known as the calcium phosphate? A. Yes.

Q. Now, then, under that process the phosphoric acid and the soluble phosphates leaching down in solution, I ask you now as a geologist whether or not the calcium phosphate bed as thus formed, could be oolitic? A. Yes, sir.

Q. How do you explain it?

A. If it were soft and porous, and not consolidated, it could be easily rolled around and brought into oolitic form by wave action. [370]

Q. Could it be rolled around when deposited above the bed and between it and the waves?

A. We are speaking of it after it had acted upon the limestone below, or marl below.

Q. What became of all this deposit which the water percolated through? The wave action was prevented by that deposition, was it not?

A. That was also probably a part of the bed.

Q. Was it all one bed? A. I should think so.

(Testimony of Guy Sterling.)

Q. The limestone and phosphatic material?

A. I think probably that was all there was in the bed except the water.

Q. Do you mean to say that the limestone underneath and the phosphatic material was all put in there at one time?      A. Please say that again.

Q. Do you mean to say that the phosphatic material and the underlying bed of limestone, and which was transmitted by percolation, was all laid down at one time?

A. No; I don't say that, although it might in some modified form, something of that kind might occur.

Q. Now, if not laid down at the same time, or if it is not probable that they were laid down at the same time, the underlying bed of course was laid down prior to the phosphatic material bed, was it not?

A. Yes, sir; under that understanding.

Q. Under that understanding, which you say is a probable understanding?

A. It is a possible and probable one, but not by any means the only one.

Q. But it is a probable one. Assuming it to be a probable one, [371] then this bed of phosphatic material from which the phosphoric acid was taken by percolation, would be between the underlying bed of limestone to which the phosphoric acid was percolated, and the waves, would it not?

A. Yes, sir; but that bed of phosphatic material that we speak of there might have been practically or simply a mass of water and very finely divided material, which was practically all phosphatic material except the little impurities which we find in

(Testimony of Guy Sterling.)

the rock, and might even now be a part of the phosphate rock.

Q. Your idea then is, after this phosphoric acid and soluble phosphates came down into this underlying bed of limestone, that the oolites were formed thereafter?

A. I said the oolites were formed after the phosphoric acid had acted upon the limestone mud.

Q. And that this mud was changed into an oolitic structure?

A. The oolitic formation I think probably is due, as I said before, to the motion given to the particles by water.

Q. Notwithstanding the fact that the bed of phosphatic material from which the phosphoric acid was percolated, was above the limestone bed into which the phosphoric acid came?

A. It was above at one time. It was not above after the oolitic formation was made.

Q. If it was not above after, where was it?

A. It was with it; then a part of it. The limestone had been replaced then by the phosphate.

Q. And then the phosphate bed from which the phosphoric acid was taken by percolation, was simply mixed then with [372] the limestone bed, was it, in this material there together that was left to remain?

A. The same amount of lime there in the first place, or calcium, and perhaps some that was soluble in the water, due to its carbonic acid gas—my supposition is, and it is purely a supposition,—that the limestone that was in the mud is there now, and



(Testimony of Guy Sterling.)

instead of being a carbonate of lime it is a phosphate of lime.

Q. And that the oolites were formed after the percolation took place?

A. And the oolites the phosphate rock being now in an oolitic form, of course it must have been calcium phosphate when it was formed and made into oolitic shapes.

Q. You mean it must have been calcium phosphate?

A. Calcium phosphate before it became oolitic.

Q. In other words, this bed of limestone was impregnated first with phosphoric acid and soluble phosphates as a bed. Is that correct?

A. Well, I would not—well, we will say that as a bed, keeping in view that the beds were subject, and open as I said before, to the attack of the acid.

Q. Open to the attack of the acid, and that the acid impregnated this bed all the way through, establishing the uniformity which it now has in grade and percentage of phosphoric acid?

A. That might possibly have been altered afterwards by conditions we don't know anything about.

Q. What is your idea about that?

A. I haven't any idea. I don't pretend to have, and I haven't formed any opinion about that, because it is rather remote; too many things there I don't know anything about. [373]

Q. At least, after the impregnation of this bed of limestone mud by phosphoric acid, after that bed had been thoroughly impregnated by this phosphoric acid and soluble phosphate, then this whole bed was

(Testimony of Guy Sterling.)

changed by water action to an oolitic form?

A. I would not be quite so definite and positive as you are about that.

Q. I am not. I am asking you. I am not positive. I am not a geologist, Mr. Sterling.

A. I am as positive and definite as your question implies then.

Q. All right.

A. That might have taken place. Those beds might have been deposited in thin layers, step by step, and so we can't say, you know, that any 4 foot vein was packed down hard and solid by itself, and then another one on top of that. It might have been placed an inch at a time, and hundreds and hundreds of years between.

Q. Or millions of years?

A. I don't suppose millions of years for an inch, but it might have been.

Q. Isn't it reasonable to suppose that these oolites were formed by the phosphoric acid and by the phosphates being brought down from land areas and became segregated from this excrement and other materials there, and being washed around in comparatively shallow water were gradually covered or brought together by the deposit of calcium from the water?

Mr. DEY.—We object to this, because all of this inquiry is immaterial, and that a continuation of this examination on this line is incurring needless and useless cost and expense; that the question of the origin has no importance at all to the question at is-

(Testimony of Guy Sterling.)

sue in this case. [374]

Q. Now, answer the question.

A. Why, that theory perhaps has some good, rational basis, but it is purely a theory, and I would not say it is any better or any worse than mine.

Q. Isn't it more reasonable as to the formation of the oolites?

A. From my studies of the thing, it does not seem any more reasonable than mine.

Q. No more reasonable? A. No.

Q. I understood you to say on direct examination, Mr. Sterling, that the value of this phosphate rock, as it is commonly termed, depends on the percentage of phosphorus. Is that correct?

A. That is my understanding as to the value of it.

Q. Have you had any experience in the use of this material?

A. No, no. I don't say that it depends altogether on that; I say it depends almost altogether on that.

Q. Now recurring just a moment to this line of questions in which we were engaged before just now: Isn't it your idea, Mr. Sterling, that after these oolites were formed and this oolitic construction had taken place, that there was then a concentration and consolidation by which the strata became solid?

A. I think the formation of the oolitic structure probably constituted itself a concentration.

Q. In other words, the uniting of the oolites brought about the concentration, or a cementing together. Is that so?

A. No; I say when the material was brought in,

(Testimony of Guy Sterling.)

when it finally took an oolitic form, I say I consider that constituted the concentration?

Q. Oh, that was the concentration? [375]

A. Yes, sir; and that was afterwards, it seems probable to me. Of course, it was consolidated, because we find now it is solid.

Q. And it was in practically the same condition, so far as solidity of it is concerned, probably?

A. Well, it is in the same condition after it became consolidated that it is now. I don't think there has been any change since, of any importance.

Q. In other words, it became solid by this oolitic formation or construction of it. That was when the beds became a solid formation?

A. Well, I would say that when—after that became oolitic in form that it was after that consolidated.

Q. After it became oolitic?

A. After it became oolitic in form it was consolidated, and with the exception of the moisture or something of that kind that might have been evaporated out of it, or leached out of it, or squeezed out of it; it is probably the same form and grade now as it was then.

Q. Whenever it became solid, and it is practically the same as now, so far as solidity is concerned?

A. Yes, sir; I don't think there has been any change to speak of since.

Q. Now, when it became solid it is your idea, is it, that it was in a horizontal position?

A. Yes, sir; I think probably practically flat.



(Testimony of Guy Sterling.)

Q. And if it were in that condition it would, under present conditions, be properly locateable as a placer? A. I think not. [376]

Q. You think not. For what reason?

A. Well, one reason is that the rock is valuable on account of the contained mineral, and not as a whole.

Q. Now, let us inquire into that and see. Have you had any experience in the treatment or use of this work? A. No.

Q. And what knowledge have you as to the manner in which it is used?

A. I have obtained my knowledge from reading and from inquiries among fertilizer manufacturers.

Q. Now, explain to us what your idea is as to the manner in which this material is treated and used.

A. The general and most common way of preparing the phosphate rock for fertilizer purposes is simply to treat it with sulphuric acid, whereby the calcium phosphate, as it exists in the rock, is brought into a soluble form, due to the action of the acid and heat, which is brought about by the chemical reaction itself; so that when the rock, after it has been treated with acid, is spread over the ground, the phosphorus is in chemical combination and it is in a soluble form so that plants can take it up.

Q. How do they mix the sulphuric acid with it? Do you know?

A. Well, they generally grind the rocks up very fine, I presume—we will assume for illustration that the rock is a pure calcium phosphate, with no impurities; then the amount of acid used is in direct pro-

(Testimony of Guy Sterling.)

portion to the amount of phosphorus in that, and, of course, that is in direct proportion to the amount of calcium there is in it, so that they know how much to put in to bring about the reaction. [377]

Q. How do they treat this particular rock—not whether it was pure calcium phosphate, but how do they treat this particular rock?

A. I think that is the general way of treating that.

Q. Mixing with sulphuric acid? In what way?

A. Yes, sir; I described grinding it up finely and mixing it together and bringing about a chemical reaction between the sulphuric acid and the calcium phosphate.

Q. Is that all they do, according to your idea?

A. If they want—if they simply want to use the rocks in that shape, without mixing anything else with it; or if they do not care to extract the phosphoric acid from it I believe that is all they do with it; just use the rock in that shape.

Q. That is all they do?

A. Of course, they might treat it with other substances, depending on what is wanted—

Q. Do they?

A. They may; depending, I say, if they want to use it as a fertilizer they use it just as it comes, but if they want a neutral or alkaline fertilizer they may treat the super-phosphates after the rock has been treated with sulphuric acid, they may treat it with lime again and get it in a neutral shape.

Q. It is not a question of what they may do. Do you know what they do, as a matter of fact?

(Testimony of Guy Sterling.)

A. They do all of these things I have described.

Q. And that is your knowledge upon the subject, is that they do treat this in different ways for different purposes?

A. Yes, sir; all with the view of bringing the phosphorus into such shape that plants can take it up.

Q. Who does this work, and where done? [378]

A. Done at the fertilizer manufactory.

Q. At the fertilizer manufactories?

A. Yes, sir.

Q. And for other purposes?

A. Well, if they use the rock for other purposes besides fertilizers, it might not all be done at the fertilizer manufactory.

Q. For fertilizer purposes it is all done there, is it? A. Yes, sir.

Q. Do you know whether or not they do those things there that you say?

A. I have seen it being done at a fertilizer factory in Sandusky, Ohio, but at that factory, as I observed, they used very little of the rock alone; they always mixed it with other things.

Q. Was that phosphate rock? A. Yes, sir.

Q. When you saw it? A. Yes, sir.

Q. Now, do you say that this would not be a placer, because they mine it for the mineral contents? Is that correct? A. That is one reason.

Q. What is the mineral contents?

A. Phosphorus.

Q. Now, isn't it true that it is not mined for that at

(Testimony of Guy Sterling.)

all, but for the combination of the calcium and phosphoric acid?

A. No. The essential value of the rock is due to its phosphorus contents.

Q. And not for its phosphoric acid contents in connection or in combination with calcium?

A. No; if you had a pure bed of phosphorus—well, I will put that in another way—if it was possible to get phosphorus by itself it would be very easy to get the lime and other things to mix with this. [379]

Q. That is true, but isn't it true that it is valuable because of the calcium that is now in combination with the phosphoric acid? A. I don't think so.

Q. Now, is there a particle of phosphorus in this rock?

A. I don't say that there is. There is phosphorus in it, but not in the uncombined form.

Q. They don't mine it in order to get out any phosphorus in the uncombined form?

A. Not for fertilizers, but they do when they want phosphorus.

Q. I am asking about the fertilizers, and that is what it is mined for? A. Not exclusively.

Q. Out of these beds?

A. It may be now, but that does not apply to the future.

Q. There is not any phosphorus in it?

A. Not uncombined.

Q. And they don't mine it for phosphorus?

A. They do not now, but they may mine phosphate rock for phosphorus.



(Testimony of Guy Sterling.)

Q. They do not, and you don't know of any institution or any place where phosphate rock, this phosphate rock—this deposit we are speaking of, this phosphate rock is treated to extract the phosphorus?

A. You are referring now directly and exclusively to this?

Q. I am referring to—

A. The claims shown on Exhibit No. 1?

Q. Yes.

A. I don't know where that is shipped to, or what it is used for.

Q. And if phosphate and phosphate rock—do you know of any phosphate rock that is mined for the purposes of extracting the phosphorus uncombined?  
[380]

A. That is mined for the purpose of extracting the phosphorus uncombined?

Q. Yes. A. I have been told of that by—

Q. Do you know it, I am asking you?

A. I only know it by reading and by hearsay.

Q. By reading and hearsay?

A. I have never followed up any load of phosphate rock to see whether it was taken to the factory and used for the manufacture of phosphorus.

Q. Isn't it true that the calcium in combination with phosphoric acid, as it is in this rock, is a very beneficial and material element in these fertilizers?

A. It may be, under some conditions.

Q. Isn't it under these conditions?

A. Not invariably.

Q. Isn't it under these conditions?

(Testimony of Guy Sterling.)

A. I don't know whether it is under these conditions, any more than under other conditions.

Q. I ask you if you know.

A. I don't know; I do not say so it should be.

Q. You say you don't know?

A. I say I don't know of any condition for the conclusion that this rock is and will be mined largely on account of the contained calcium.

Q. Do you know, as a matter of fact, what this rock is mined for?

A. I believe, and it is my opinion it is mined on account of its contained phosphorus.

Q. You base that simply on what?

A. On general knowledge of the use of phosphate rock.

Q. All on your general knowledge of the use of it?

A. Yes, sir. [381]

Q. Now, that phosphate rock is used as a fertilizer? A. As a fertilizer.

Q. That is true.

A. It is not used that way, because that is the best way to use it; it is used that way because it is the most convenient, I think, and practical way of using it.

Q. Or commercial way of using it?

A. That all amounts to the same thing; nevertheless it is the phosphorus they are after.

Q. That is your idea of it?

A. That is my idea; if there was not any phosphorus in that rock it would not be mined for fertilizer purposes.

(Testimony of Guy Sterling.)

Q. Do you mean to say that it is mined for the purpose of getting this phosphorus out?

A. To put that phosphorus in shape for the plants to use.

Q. Now, don't you know, Mr. Sterling, that the plant cannot use phosphorus not combined, and could not take it up?      A. I did not say it did.

Q. Could it?

A. Not unless it was in soluble form.

Q. Could they take up phosphorus uncombined?

A. They could if in a soluble form, for all I know.

Q. Do you know?      A. I don't know.

Q. As a chemist?

A. I believe they could if it was in soluble form.

Q. As a chemist, do you know whether they could?

A. That the plants take up phosphorus?

Q. Uncombined?

Mr. DEY.—I would like to inquire what this has got to do with the issues in this case. [382]

Mr. BUDGE.—The particular materiality of this testimony is based on the statement of the witness that this is not a placer for the reason that it is mined for its mineral contents only, to wit; the phosphorus.

Q. Did you ever know or hear of such a thing as phosphorus in solution, uncombined phosphorus?

A. No; I don't believe it will go in solution alone.

Q. And, therefore, the plants could not take it up?

A. As I say, it has got to be in solution.

Q. It would be in solution, it must be, in order to take it up?      A. The phosphorus?

(Testimony of Guy Sterling.)

Q. Yes.

A. You can put it in the shape of phosphoric acid.

Q. You said you wanted it in solution. I am asking you how you get it in solution?

A. By making phosphoric acid out of it, and it is—

Q. Is it phosphorus?

A. It is not phosphorus uncombined, but phosphoric acid.

Q. So that phosphorus uncombined is not a soluble substance then? A. Not in water.

Q. Is it not a soluble substance?

A. Not in water.

Q. It is simply an element of nature?

A. It is an element of nature; no question about that.

Q. Now, it must have calcium in it in order to enable the plant to take it up after this treatment?

A. I don't agree to that.

Q. You don't agree to that. What do you say about it? A. I say—

Q. You say it is not a fact? [383]

A. I say that taking phosphorus, starting out now with pure phosphorus—

Q. I am not asking you about pure phosphorus.

A. I am answering your question in my own way.

Q. I want you to answer my question without any put-in.

A. You take phosphorus in pure shape and dissolve it in acid, making phosphoric acid, and then dilute it with water and mix it up with another substance, earth, sand, or anything that you like, and



(Testimony of Guy Sterling.)

spread it out upon the ground, the plants will be able to get the phosphorus from that phosphoric acid in that shape, and it is not necessary to put any lime with it at all.

Q. Are you satisfied with that statement?

A. I am satisfied with that, from what I have read and have been told by manufacturers of fertilizers.

Q. Now will you answer my question. Do you or do you not know the impossibility of a plant taking up phosphorus uncombined?

A. Well, I will have to answer that the way I did before, that it has got to be in a soluble form. It may be possible to dissolve phosphorus, to a small extent, in water, if you take time enough, and then it would be uncombined.

Q. Is that the best answer you can make me to my question?

A. I think that is the best answer, and a proper answer.

Q. That phosphorus uncombined can be taken up?

A. If it can be brought into a soluble form.

Q. I am not asking that question at all. Answer the question. In an uncombined form is phosphorus capable of being taken up? [384]

A. I will ask you to explain that.

Q. You are not asking me. I am asking you.

A. I will have to know what you mean by an uncombined form.

Q. I mean the element phosphorus, uncombined with any other element.

A. I have to have some sort of a concrete idea of

(Testimony of Guy Sterling.)

the subject. I am trying to answer your questions. Now then, I am assuming, in answering your question, if there is a chunk of phosphorus lying in a field, as big as your fist, I will undertake to say that the plant will take it up.

Q. And that is the only form, in a solid way, that you find phosphorus uncombined?

A. You don't find it uncombined at all. You have to manufacture it.

Recess until 2 P. M.

Q. As I understood you, Mr. Sterling, you stated that the reason why this bed, after it had become solid and in a horizontal position, the reason why, under present conditions, it would not be locateable as a placer, is for the reason that it is mined for its mineral contents. Is that correct?

A. Yes, sir; as distinguished from the rock as a whole.

Q. Now, calling your attention to a lime quarry, and that is mined for its mineral contents, isn't it, as distinguished from the rock as a whole?

A. Yes, sir; but that is a difference of a placer as compared with a quarry, and if this was to be located as a placer of phosphate rock, it would have to be located under a special application of the placer act to quarries.

Q. So far as the fact that the substance is mined for its mineral [385] contents, now bearing in mind that element alone, there is no difference in mining this for its mineral contents as a placer, and there would be no difference in mining gold for its

(Testimony of Guy Sterling.)

mineral contents as a placer, would there, bearing in mind that element alone?

A. No; in both cases they are mined for the valuable contents.

Q. Yes. Then calling your attention to limestone, which is mined for use as calcium oxide, that is mined also for its mineral contents, isn't it?

A. It would in that particular instance, but that is a very narrow construction, as compared to the purpose for which limestone quarries are located.

Q. I am speaking of this particular purpose.

A. It is very possible you might locate as a placer a limestone deposit, for the purpose of making oxide or hydrate of calcium.

Q. And that would be the only way to locate it, would it not, as a placer; that is, it is not located in mining operations in any other way?

A. I don't think you could properly locate it in any other way.

Mr. DEY.—I object to that as calling for a conclusion of law.

Q. And calling your attention to gypsum or calcium sulphate, that too is mined and located as a placer, isn't it? A. Yes, sir.

Q. And that is mined for its mineral contents?

A. Mined as a rule— [386]

Q. Almost overwhelmingly so?

A. —for its use as a whole.

Q. And it is not mined for the calcium that is in it, is it? A. As a whole.

Q. Nor for the sulphate that is in it?

A. Not that I know of.

(Testimony of Guy Sterling.)

Q. And it is mined for the calcium sulphate.

A. It is mined for the calcium phosphate, and that is what gypsum is.

Q. I mean calcium sulphate.

A. Calcium sulphate.

Q. That is used as a fertilizer, and is located and mined as a placer?

A. Sparingly, that and other uses.

Q. It is used that way?      A. It may be used.

Q. And is?      A. To some extent.

Q. Commercially?      A. Yes, sir; to some extent.

Q. Now, isn't it—

A. I want to explain my answer a little more definitely. It is not used in the sense of a fertilizer that phosphate is used. There is a vast difference, and I feel I have a right to explain this.

Q. Yes, you have. You are perfectly right on that.

A. It is used more for its mechanical effect upon the soil, except in connection with alkaline rock, and phosphate rock is treated and put into condition for use as a fertilizer after treatment with sulphuric acid, and it is the chemical result that we desire to obtain, and not, except to a very slight degree, the mechanical effect.

Q. And then do you make a distinction between the mode in which [387] calcium phosphate and calcium sulphate should be located, simply by reason of the different way in which they affect the land upon which they are placed after they are prepared?

A. My reply to that question is to bring out the point that the use of phosphate rock as a fertilizer



(Testimony of Guy Sterling.)

involves chemical treatment, whereas the use of gypsum as a fertilizer does not necessarily require or involve chemical treatment.

Q. Now, then, if that is true do you make the distinction between a location of gypsum, the manner of locating gypsum and the manner of locating phosphate rock, make the distinction because of the fact that one is—because of the different manner in which they affect the land on which they are placed?

A. Not on account of the effects, except as one element more, on account of the fact that one requires chemical treatment to make the contents which is desired available, and the other does not require chemical treatment.

Q. Now, then, do you make a distinction, or do you say that phosphate rock should not be located as a placer, because it is treated chemically after it is mined?

A. I would not put it so briefly as you do, but that involves my reason, yes.

Q. That is a reason?      A. Yes.

Q. All right. I want to get your reason. Now, calling your attention—

A. I would like to make a little further statement. That is one reason, is what I want to add.

Q. Now, you say that, calling your attention to your statement that this would not be a placer after it became solidified, and in its horizontal shape and position because of the [388] fact it is mined for its mineral contents: salt is also located as a placer?

A. Yes, sir; under a special act.

Q. And it is mined for its mineral contents?

(Testimony of Guy Sterling.)

A. It is mined for itself as a whole.

Q. Mined for its mineral contents?

A. Mixed up with any impurities it is, but it is usually mined in a practically pure state as a whole, and used as a whole.

Q. It is not mined for the sodium in it?

A. It might be.

Q. Is it used for commercial use?

A. Frequently it is mined for the purpose of manufacturing sodium from the salt.

Q. But all salt mines locateable, which are located as placers, are nevertheless mined for their mineral contents?

A. I would not put it that way, Mr. Budge. I would say the salt was mined for the salt.

Q. And what is salt? It is sodium and chlorine, isn't it? A. Yes, sir.

Q. Now, it is not mined for the sodium, and it is not mined for the chlorine? A. No.

Q. But it is mined for the sodium and the chlorine?

A. In the sense I speak, neither chlorine or sodium would be salt. It is the combination that makes salt, and they are mined for the salt.

Q. And it is the combination of the phosphoric acid and the calcium that you mine, that is to say, the reason you mine it?

A. That is not the only reason that you mine it, you mine it [389] on account of the phosphorus in the rock.

Q. Calling your attention to borax, or Colemanite, known as calcium and borax, that is mined as a

(Testimony of Guy Sterling.)

placer, isn't it? A. Mined as a placer?

Q. Yes.

A. Of course, I can't go into the subject of how mined; you mean located?

Q. I mean located, yes, sir.

A. I believe that all there are in this country are located as placer.

Q. And that is mined for its mineral contents?

A. Yes, sir; that is mined in two ways, I believe, for use as a whole in the purified state, and also for the manufacture of boric acid, and some for the borax.

Q. And for washing substances?

A. Yes, sir; just for manufacturing purposes.

Q. Yes. Now, then, that is simply calcium borate, and this is calcium phosphate?

A. I must say I am not well acquainted with the chemical formula of borax.

Q. Well, calling your attention to coal: that is mined for its mineral contents?

A. A special act, located under a special act.

Q. A modification of the placer law, but located as a placer. A. No; I think not.

Q. What is the difference?

A. It is located by a special act—

Mr. DEY.—I object to that as wholly immaterial and improper.

A. You can make a special act for anything [390] you locate and then it is outside of that class.

Q. In what manner does a coal location differ from a placer location, an ordinary placer location?

Mr. DEY.—I object to that as calling for a conclu-

(Testimony of Guy Sterling.)

sion of law; and all of this is immaterial. The only question is as to the form in which the deposit is found, being in rock in place, and anything as to the law governing coal, or any other special act, is wholly immaterial.

A. I say—perhaps I had better ask you to repeat the question.

(Question read.)

A. Why, there is simply a difference in this, that one is coal and is located under a special act, and a placer location has a broad significance as compared with that. There are several special applications of law to the placer act.

Q. I am not asking you as to what acts it is located under. I ask you to tell me the difference in the manner of locating coal and other placers.

A. To locate coal—

Q. If you know.

A. I can give it to you in a general way, just from my knowledge of the application of the law, that you apply to file on 160 acres, or whatever number of acres you want.

Q. File on it?

A. Make an entry, I should say. You file at the United States Land Office, within the district that the coal occurs.

Q. In making that filing of course you make an application to enter the coal lands.

A. I think that is about all there is of it.

Q. It is by the acre?

A. It is by the acre, and you finally purchase it of the Government. [391]



(Testimony of Guy Sterling.)

Q. And which you do of a placer claim?

A. Yes, sir; you do eventually, except you have to do assessment work on the placer, and you don't, as I understand it, on a coal claim.

Q. Nevertheless, it is taken up by acres?

A. Oh, yes; all Government land is taken by acres.

Q. Well, what I mean, taken by the acre, is taken by acreage in a different form from what a lode is, and you are confined to your side lines on a coal location as you would be in a placer location strictly?

A. Yes, sir.

Q. Now, in this report, Mr. Sterling, from which you read, you use the term here—you make the statement, as I understand it, that this is a sedimentary deposit? A. I think so.

Q. An original sedimentary deposit?

A. Yes; of course, that is just my opinion.

Q. An original sedimentary deposit?

A. Yes, sir.

Q. Now, in this report you state that in giving the description of the series:

1st: Hard, silicious, dark blue limestone hanging-wall.

2nd: Vein of good grade phosphate rock, dark brown in color, 9 feet thick.

3rd: Thin stratum or wall of shale.

4th: A vein of high grade blue gray phosphate rock, 4 inches in thickness,—4 feet in thickness.

5th: Thin wall of shale.

6th: Vein of good grade dark brown phosphate rock, 14 feet thick. [392]

7th: Wall of black chert, and so on.

(Testimony of Guy Sterling.)

Now, why is it that you call this a vein, and the limestone and the chert walls?

A. Just the same as you would in a metal mine, to distinguish the valuable part of the deposit from the invaluable part of the walls.

Q. Well, suppose that you are intending, or desired, or anyone else, for that matter, desired to mine this intermediate strata of limestone. You would not call that a vein, would you?

A. No; I would call it then a bed of limestone, the same as if it was a solid vein of gold running through there, with limestone walls, if a man wanted to locate that as a limestone bed, why he would have a perfect right to do it, but he would have to exclude the gold, however, from the placer location.

Q. I am talking about a bed of limestone without gold. If he intended to locate on the limestone strata you would not call that a vein, would you?

A. No.

Q. Now, as a matter of fact, from your description of the manner in which this deposit was laid down, the deposition of the two beds was practically the same? A. Both sedimentary.

Q. And both laid down in practically the same manner? A. Probably.

Q. And the same as a bed of sandstone would be laid down, as a matter of fact?

A. Well, probably similar, of course. I say probably similar.

Q. As a matter of fact, Mr. Sterling, isn't it true that in this [393] Montpelier Canyon, when you went over this ground, and which you inspected, that

(Testimony of Guy Sterling.)

there is a showing that underneath the calcium carbonate is a bed of sandstone?

A. Yes, sir. I think we saw that up in the Obey and Obed lodes.

Q. And that sandstone and calcium carbonate and calcium phosphate and the chert are all beds or strata originally sedimentary beds or strata of the earth's crust? A. I think so.

Q. Now, is that the only reason why, the one you have given me, why you call this a vein, simply because it is the particular portion of the series which is sought and which is located upon?

A. And is valuable.

Q. And is valuable?

A. For its mineral contents.

Q. Well, is that the only reason? Any other reason?

A. The other reasons are that it is in place.

Q. I mean so far as defining it to be a vein.

Mr. DEY.—That is perfectly proper.

A. That is what I am trying to answer. It is a vein because it is in place and has walls, and generally speaking, a well defined dip and strike.

Q. Now, then, the limestone and the chert and the calcium carbonate are all in place?

A. In place and form walls of the phosphate rock, and consequently have practically the same dip and strike.

Q. And that I say: they have the same characteristics of a vein in the strike, dip, etc., as have beds of phosphate rock.

A. That is true of all veins. [394]

(Testimony of Guy Sterling.)

Q. I say it is true of this.

A. It is true of this and true of all veins.

Q. So that the mere fact that this calcium carbonate has a dip and strike to it does not entitle—or the mere fact that the sandstone and the intermediate beds between the phosphate layers have a dip and a strike to them, would not give them the right to have the same vein at all?

A. No; because they have no value on account of the mineral contents.

Q. They have no value on account of mineral contents. For limestone they would have for the lime, for the calcium oxide, would they not?

A. Not in my opinion.

Q. It would not have that?

A. Not in my opinion.

Q. What would it be mined for?

A. Be mined for the limestone as a whole.

Q. And not for its mineral contents?

A. Not in my opinion, speaking as a whole and in general.

Q. In other words, you determine—

A. Of course, I am going ahead now a little further. You want to get this down very fine. The distinctions are, of course, difficult to determine on any hair-line, but you might go to work and take up a marble quarry, or a common worthless limestone quarry, for the purpose of the extraction of the calcium metal itself.

Q. That is true; but that would not be the general purpose of taking up a limestone quarry.

A. It was not the purpose in view when the law in



(Testimony of Guy Sterling.)

regard to placers and lodes was made by the United States Congress? [395]

Q. That is your opinion about it?

A. That is my opinion of the whole thing, so far as I am concerned, as a matter of opinion, whether these claims should be properly lode claims or placer claims.

Q. Don't you know, as a matter of fact, Mr. Sterling, that there are a great many beds of limestone that are quarried and located as placers, for the purpose of getting the lime to be used as calcium oxide?

A. You mean for the purpose of making lime, that they use in making mortar?

Q. Yes; and I will go further, and say for the purpose of getting this lime and using it commercially as a fertilizer.

A. Yes, sir; but in that case it is used as a whole.

Q. And it is mined in that manner, or located in that manner? A. Not in this western country.

Q. I am not asking about the western country.

A. Well, there are no placer claims anywhere else except in the west.

Q. Where is this located?

A. I mean located in the sense you use it there, that limestone quarries are worked for that purpose, the extraction of limestone for fertilizing purposes.

Q. Well, for building purposes then?

A. Yes, sir.

Q. There are a great many of those?

A. Oh, yes.

Q. Where it is mined for building purposes?

A. Yes, sir.

(Testimony of Guy Sterling.)

Q. And if the limestone has calcium oxide—

A. Yes—I must go ahead a little further now. The fact still [396] remains that that calcium oxide is not, strictly speaking, a chemical result; it is not the result of the chemical treatment of the rock itself; it is merely brought about by calcining the limestone.

Q. And then, you still stay with the same idea which you expressed, that the manner of locating this calcium phosphate should be determined by the manner in which it is treated after it is mined?

A. That is one important point.

Q. Now, you have stated during your experience in examining mines in different districts, of veins of ore and the manner of their occurrence in different strata, haven't you? A. Yes, sir.

Q. And paid attention to those conditions?

A. Yes, sir.

Q. Now, other than what you have stated, that is to say, other than the fact that this is valuable for its mineral contents, that it has a dip and a strike the same as the limestone and chert and calcium carbonate that go with it, and has the same strike as this, and has this calcium phosphate there are no other characteristics of a vein, as it is commonly understood in mining? A. Now, I think you—

Q. Can't you answer?

A. I can't answer it yes or no, because—I will ask you to read the question.

(Question read.)

Well, no, your question involves the fact, or im-

(Testimony of Guy Sterling.)

plies and admits the fact that it has got a dip and strike and walls, does it not? [397]

Q. Yes; as you have defined it.

A. Yes, sir; and then, we will admit the chemical part of it pretty thoroughly, and with that understanding I will say that I think there is no other condition there necessary to make it proper for a lode location.

Q. I didn't ask you that question.

A. I don't know of any condition that is missing.

Q. No; answer my question.

A. I think I am answering it; I am trying to.

Q. I asked you if it had any of the characteristics of a vein. I did not ask you whether it was properly locateable as a lode, but whether it has any characteristic of a vein, as the word vein is commonly understood in mining.

A. I think it has every characteristic of a vein, as understood in mining.

Q. I say other than what you have given me?

A. No; but that is what I am trying to say, that I do not at this present moment think of any other characteristic that a vein could have, that this vein has not already, speaking in a general way.

Q. Well, let me ask you this. Isn't it true that a vein, as it is commonly understood in mining, and by a vein I mean with a mineral ore zone located as a lode, that the mineral substance is of a later—that is, comes into the mineral zone later than the country rock? A. Yes, sir.

(Testimony of Guy Sterling.)

Q. In that respect this differs from a vein, does it not?

A. It differs from some veins, but the law don't.  
[398]

Q. I am not asking you about the law. I am asking you about a physical fact.

A. You are asking about a miner that locates these—

Q. I am not asking you anything about a miner locating or with reference to a placer or a lode. I have not asked you that question at all. Answer the question.

A. The deposit of phosphate rock was older than one wall and younger than the other.

Q. Now, that is not true with the ordinary vein, as it is understood in mining, is it?

A. You mean now according to scientific mining?

Q. No; I am talking about practical mining.

A. Yes; practical mining.

Q. Or scientific either.

A. Not invariably; as a rule in metal mines the fact is that the deposit of ore is younger than the walls, yes.

Q. In that respect this differs from an ordinary vein as you understand it?

A. It differs from that kind of a vein.

Q. It differs from what is commonly understood to be a vein among miners, and in the mining business? A. No; I don't think so.

Q. You don't think so. All right. Then, let me ask you this: the manner in which this calcium phos-



(Testimony of Guy Sterling.)

phate comes into place is not the same as the manner in which the ore body of a vein comes into place?

A. It is owing to the manner in which it gets into all veins; the manner in which it comes into this vein. [399]

Q. I am not talking about this vein. I am talking about veins that are known to be locateable as lodes.

Mr. DEY.—All veins are locateable as lodes.

A. I cannot make that discrimination, Mr. Budge. I do not—

Mr. BUDGE.—On that theory you are very anxious to make your answer apply—

A. I don't mean the—

Mr. DEY.—I object to that remark. There is no occasion for it at all.

Mr. BUDGE.—I think there is.

Mr. DEY.—He is endeavoring to answer the questions, so far as they are intelligible.

Mr. BUDGE.—I think that the remark is justified by the witness's disposition to be evasive and not to be candid.

A. Well, I have got something to say about that. I am being as candid as I know how. I simply don't intend to have my answers misunderstood and construed in either a broader or a narrower way than I think they should be.

Mr. DEY.—I will state further, for the purposes of this case, that the learned counsel for the San Francisco Chemical Company may make a statement as to his theory of the origin and genesis of the

(Testimony of Guy Sterling.)

phosphate vein or lode, that it may stand for the purposes of this case.

Mr. BUDGE.—We will do that when we come to put in the evidence for the defendant. [400]

Mr. DEY.—I offer it so that you can do it now, and thereby save time. We make no point upon it, one way or the other.

Mr. BUDGE.—We will reserve that right until we come to our defense, as we have a right to do.

Q. I will ask you, Mr. Sterling, whether there is any vein, as it is commonly understood in mining, any vein, as the word vein is commonly understood in mining, of any nonmetallic mineral, save and except the one case referred to of Webb against the Asphaltum Company—excepting that case, do you know of any other nonmetallic mineral veins?

A. Are you speaking in respect to nonmineral, in the sense that a chemist uses that according to his definition?

Q. I am speaking of it in the sense that miners use it.

A. Well, I must say I don't know exactly where the miner draws the line between a nonmetallic substance and a metallic substance.

Q. Then, I will ask you to express yourself as a mining man, or a mining engineer, whether you know of any other nonmetallic mineral vein than the one to which I have referred?

A. I don't recollect any now.

Q. Then, I will ask you whether or not, Mr. Sterling, it is not true—I will ask you this,—as a geolo-

(Testimony of Guy Sterling.)

gist—that the deposits which are found in what are commonly understood to be veins, were injected into a crevice or fissure in the rock, of course, after the formation of the fissure?

A. May have been. [401]

Q. Is not that the commonly accepted idea among geologists?

A. Not universally. I have no objection to admitting that, the truth of what your question implies, but I will simply say this though, that among geologists there are a great many theories in regard to the formation of ore bodies, and I don't think any of them claim that that is the only way an ore body can be formed or occur.

Q. Do you understand that there is any dissent from that idea among geologists?

A. I have heard of other theories than that.

Q. Who are they? What theories, and who announce them?

A. Why, they are theories that the deposition of ore in the veins may be due to concentration and gather together in the fissure the mineral from the side walls; it may come from below; it might possibly come from above, and it might be an eruptive mass.

Q. But always this ore, or mineral rather, whichever you may term it, comes into the fissure; whether from above or below or from the sides, after the formation of the fissure? That is the accepted idea among geologists?

A. That is classed as generally true, but often a

(Testimony of Guy Sterling.)

fissure is formed by chemical action of metals in the form of salts, etc., or acids, etc., being in the water and eating away the walls, and making deposits in the cavity that had been eaten away.

Q. But nevertheless, the substance for which the miner is seeking, and which constitutes the valuable property, comes into the fissure after it is created, whether it is created [402] by this eating away, or whether by some internal force that parts the rock?

A. Yes, sir; it is a concentration in the crevice.

Q. Yes; in the crevice. Now, is there any crevice to this calcium phosphate deposit?

A. No; I have said it was a sedimentary deposit.

Q. Now, let me ask you this, if it is not true that in the use of the term vein, as understood in mining, that the deposit in the vein is of varying degrees of thickness? Do you know of a particular vein?

A. Sometimes they vary, and sometimes they are very uniform.

Q. Do you know of any vein that is uniform for any great extent, or to any great extent?

A. Yes, sir.

Q. Where?

A. I remember one particularly, over in Bingham, a bed of low grade copper and iron pyrites, that was, as I remember it, that was about 4 feet thick, and it didn't seem to vary at all.

Q. For what distance?

A. Well, as I remember it, the shaft, which was an incline shaft, was driven down about 400 feet in



(Testimony of Guy Sterling.)

depth along the vein, and then, I think there was a drift at the foot of the incline 300 or 400 feet, and the vein seemed to be of uniform thickness of low grade copper ore.

Q. Uniform thickness?

A. Between the beds of quartzite.

Q. And did you examine that personally?

A. Yes, sir; I am speaking about what I have seen.

Q. I see. I thought perhaps it was something that you learned from reading.

A. No; I saw it. [403]

Q. And you examined it carefully yourself?

A. Yes, sir; I went down in the mine itself.

Q. Did it have a uniformity such as you observed in this calcium phosphate deposit?

A. It did, as far as any of these workings extended. I don't say that bed of low grade copper ore extended indefinitely at that uniform size, or anything of that kind. It was uniform for those dimensions I have given you.

Q. Now, is that the only instance that you can relate?

A. That is the only one I remember of seeing, as I remember of that kind. I have seen beds of iron ore, though, that were practically as uniform as any of these beds.

Q. Beds of iron ore?     A. Yes, sir.

Q. Where?     A. Down in Iron County.

Q. Down in Southern Utah. Now, they were not in the form of a vein, were they?

A. They were located as lodes; yes, I call it a

(Testimony of Guy Sterling.)

vein, a contact vein.

Q. A contact vein?

A. Yes, sir; and it was decided from the evidence given in this court that it was a replacement.

Q. We won't go into the replacement question, but we will stay with this question of a vein. Isn't it true that usually and in the vast majority of instances the ore deposit, in what is commonly known as a vein, does vary in thickness?

A. It is a very common occurrence.

Q. And it is the most common—in fact, it is unusual when it occurs as you have described it over in Bingham? [404]

A. It is unusual in that camp; that is the fact; and I say that that is usually the case with veins, that the extent of the ore body, or thickness of the ore body is not the same.

Q. It is not uniform, in other words?

A. No; not often. I have seen copper deposits, come to think of it, carbonate of copper in sandstone that was very uniform.

Q. Did you ever see any that extended for a distance of four miles?

A. I have not seen any that extended a distance of four miles on the strike, but on the dip pretty near that far.

Q. But not on the strike? A. No.

Q. But as you say, ordinarily a vein is one which varies in thickness? A. Yes, sir.

Q. And it is one also, Mr. Sterling, which varies in extent; and by that I mean there is no uniformity

(Testimony of Guy Sterling.)

as to the extent of the vein along the strike—following the strike of the vein it pinches out in a great many instances in veins of ore?

A. Yes, sir.

Q. And it is found in pockets?

A. That happens in all ore deposits, I think, of every kind.

Q. It is found in pockets? A. Yes, sir.

Q. And in that respect it is different from the usual and ordinary vein; it is different from a calcium phosphate deposit?

A. Different in degree. I don't think there is any difference [405] absolutely.

Q. Isn't it also true, as you have stated, this calcium phosphate—take any given bed of this calcium phosphate, that it has a very great uniformity of value? A. In particular bodies?

Q. Yes.

A. As far as my observation has extended, that is so—of course none very deep—none of the observations go deep.

Q. I am asking you as far as you know.

A. Yes, sir.

Q. That is not true of the ordinary vein, is it?

A. Well, it depends on the character of the vein. Now, there are big low grade bodies of copper ore that extend in uniform value for long distances.

Q. For how long? A. And iron ore too.

Q. How long in copper?

A. Well, I was speaking of that one which I mentioned before.

(Testimony of Guy Sterling.)

Q. That is on the dip?

A. Yes—oh, you mean on the strike?

Q. Yes.

A. Well. I don't think I have ever seen any deposit of any ore exposed on the strike for such great distances as it is in these beds of phosphate rock.

Q. Now, as a matter of fact, there is not any such a vein known, is there, in the history of mining, that extends like this does, so far as your knowledge goes? A. Not with the continuity of it.

Q. Isn't it also true, Mr. Sterling, that veins do not conform to the stratification planes of the rock in which they are found?

A. Not always. [406]

Q. Well, generally?

A. It depends upon the character of the formation and character of the vein, where it is. I don't think that a man would be right in saying that was the rule or not the rule.

Q. Isn't it true where it does follow the stratification planes that it is only for short distances, comparatively short distances, and then, it breaks through the different strata?

A. I have heard of that occurring.

Q. Isn't that true, from your examination of veins? A. Not absolutely.

Q. Not absolutely, but generally.

A. It is sometimes true, and sometimes is not. I know of deposits that—

Q. Answer my question.

A. I can't say whether the universal rule.



(Testimony of Guy Sterling.)

Mr. DEY.—He is answering it.

Mr. BUDGE.—He is not answering it at all. I asked him whether that was not generally true, and he says not universally true.

A. I will say it is not generally true, then.

Q. That is what I want to get. If you will answer my questions we will get along faster. Now, would you say it is generally true that veins, as a vein is commonly understood, do follow the stratification planes of the rock in which they are found?

A. I would not be able to say that there is any common understanding about that. [407]

Q. I am not asking you for any common understanding.

A. I thought you asked me if it was commonly understood.

Q. What do you understand—

Mr. DEY.—That is just exactly what you did ask him.

Mr. BUDGE.—I beg your pardon, if that is the question.

A. Why, I understand a vein may, and I know that they actually do exist both in conformity with the stratification, and in intersection with it.

Q. And in which form do they most often occur?

A. We will take it over at—

Q. No, take it altogether.

Mr. DEY.—I object to that as immaterial to any issue in this case.

Q. Taking it altogether in mining—I am not asking you about Bingham.

(Testimony of Guy Sterling.)

A. I have to give you my personal experience.

Q. From your personal experience what do you gather as a conclusion as to the whole proposition, the whole country?

A. All right; you want to know my general conclusion from my experience in Utah here, which is that there are probably just as many deposits here on the bedding planes as there are on fissures that cut across.

Q. That is to say, that your experience is to the effect that ore deposits, which are commonly known as veins, within the State of Utah as often follow and conform to the stratification planes of the rock in which they are found, as they intersect?

A. Yes, sir; that is my experience.

Q. In these veins where the stratification is followed, is it followed in the manner that this deposit, that the calcium [408] phosphate appears in this deposit?

A. The ones that I speak of, yes. They are right on the beds between sedimentary formation.

Q. Just as well defined as this, so far as the stratification planes are concerned? A. Frequently.

Q. Those that I am talking about, all of them?

A. Not all of them; they vary. Some are in lenses, and some will run in even beds along the stratification planes.

Q. For what distance?

A. Of course, none of these mines I speak of have been developed to any great extent. The maximum I think would be a thousand feet deep.

(Testimony of Guy Sterling.)

Q. On the strike, are you talking about?

A. Oh, on the strike—well, none of them, I know, would be any more than three or four claims long.

Q. Well, what about the workings?

A. That is the exposure on top, three or four claims long. The workings, as I have said, none of them are a thousand feet deep. Most of it is not over three or four hundred feet deep; the most of them would have a maximum of thirteen to fifteen hundred feet of drifts and workings on the vein.

Q. And in these deposits concerning which you have testified, and which you say are as great and as many in number as the deposits that intersect the strata, the ore body follows the stratification just as clearly and as distinctly as this calcium phosphate follows the stratification plane?

A. Yes, sir; that has been my personal experience.  
[409]

Q. Isn't it true, Mr. Sterling, that veins are in igneous rock?

A. Certainly so, but not all of them, though.

Q. Most of them?

A. I don't think you can say that, in the sense that the vast majority of them are.

Q. You would not say a vast majority, but you say most of them?

A. I suppose you mean by that vast majority.

Q. Well, what do you say?

A. Well, I would say, as I said before, my experience in Utah is that most of the deposits here in this country have walls of sedimentary rock.

(Testimony of Guy Sterling.)

Q. Of sedimentary rock. Didn't you say—State-line is not among that number?

A. No; that is an igneous formation entirely.

Q. What about Ophir?

A. At Ophir the ore occurs over there in the bedding-planes of the limestone.

Q. And in Tintic?

A. In Tintic it is irregular; sometimes it is on the bedding-planes, and sometimes cutting across it.

Q. Any in igneous rock?

A. There is in a part of the district, and part of the district there is not.

Q. A part there is and a part there is not. What about the Bingham country?

A. Well, there is both igneous rock over there and sedimentary, and a good deal of the ore over there that I am acquainted with, occurs on the bedding-planes in the sedimentary formation.

Q. Do the veins in the igneous rock follow any bedding-planes? [410]

A. Well, as a rule igneous rocks have no bedding-planes.

Q. Have you read Bulletin No. 436, by George H. Girty? A. No; I have never seen that before.

Q. Did you ever hear of any fauna in veins and vein deposits, as the word vein is commonly understood?

A. I have heard of fossils, that is fossils in which the material had been replaced by metal and mineral in veins.

Q. Have you ever heard of what is known as an



(Testimony of Guy Sterling.)

ore body in veins, or a vein or ore body containing fauna?

A. I think that I have heard of that occurring where fossils—or the shape of the fossils had been found in bodies of ore.

Q. Now, that does not answer the question.

A. I think it does.

Q. I didn't ask you about the shape of the fossils at all.

A. Well, it would be a fossil, although it would be replaced by something else. The material there would be different from what the fossil was in the first place.

Q. The impression of the animal is what you mean? A. Or shell.

Q. Or something of that sort? A. Yes, sir.

Q. Now, you say you have heard of it?

A. Yes, sir.

Q. Where?

A. I can't remember distinctly, but I have heard of it.

Q. Now, then, as a matter of fact fauna does not occur in vein deposits, does it?

A. Yes; it might be a part of the wall that was left, in the vein after the *wall eaten* away; it would be in the vein and in the deposit. [411]

Q. Now, where does that occur?

A. I say I don't remember, but I remember distinctly of hearing of it, although I don't remember where it was I saw that, or heard of it.

Q. You don't know where you read of it, or any-

(Testimony of Guy Sterling.)

thing about it?

A. No. It was in some geology I read it, undoubtedly.

Q. And you don't know where it was stated that those conditions obtained?

A. No; I don't remember that now.

Q. They do not obtain in Utah, do they, so far as your information goes?

A. I don't remember anything of that kind in Utah.

Q. And you have never heard of any particular place in this western country where there was fauna in any vein deposit, have you?

A. I think that I have heard of it, of fossils that had been replaced by mineral and metal being found in the silver mines at Silver Reef Mine in Utah.

Q. You mean the Silver Reef Mine?

A. Yes, sir.

Q. Down there at St. George? A. Yes, sir.

Q. Is that the only place?

A. That is the only place I remember of in Utah.

Q. Are you positive of the fact that there is fauna there?

A. Yes, sir; I think there have been both fossils, leaves and twigs in the shape—or metal in the shape of leaves and twigs have been found in those mines there.

Q. As a matter of fact, that is not strictly a vein ordinarily, as veins are commonly understood. In fact, that is an exception, that deposit, in the nature of its formation?

(Testimony of Guy Sterling.)

A. If you ask me if a vein all I can say is that it is located [412] as a lode, and considered by the miners as a vein.

Q. Is it a fissure vein?

A. I would not quite say fissure vein; it is a vein, though.

Q. It is exceptional in the nature of its formation, isn't it?

A. Well, I am not familiar enough with that to say. It may apply.

Q. Have you ever seen it?

A. No; I never have.

Q. Do you know of any other place?

A. In Utah?

Q. Yes; or in the west.

A. I don't remember any now.

Q. Remember any place anywhere?

A. I don't remember any place in particular.

Q. Or in general?

A. No, nor in general, not any more than I have already stated.

Q. Now, these beds of calcium phosphate belong to a certain geological age, don't they?

A. They must.

Q. In the Upper Carboniferous age; isn't that correct? A. They must, of course.

Q. Isn't that true? A. I presume it is.

Q. That is the accepted theory of geologists, isn't it? A. Yes, sir.

Q. And vein deposits, as they are commonly understood, do not belong to any given age, do they?

(Testimony of Guy Sterling.)

A. Not necessarily.

Q. They usually occupy, as veins are actually understood, fractured zones, don't they?

A. Well, no, not necessarily; they do and they do not. It depends upon the conditions that happened to exist there at that particular point.

Q. Is not that one of the peculiarities or characteristics [413] of veins?

A. It is a characteristic; it is not a general characteristic.

Q. Well, it is true also that veins are usually found in igneous rock?

A. Well, that, as I stated a little while ago, I would not say that they are found in one any more than in the other, in my experience in Utah.

Q. From your knowledge as a geologist, what do you say?

A. I would say the same thing. I would say that if you examined the whole field very carefully you would find probably as many deposits here occurring in the sedimentary rock as they do in igneous rock.

Q. Your answer to the question then, as a geologist, would be that veins are not usually found in igneous rock?

A. No. I say just the contrary. I say they are found there, and they are found in sedimentary rock too.

Q. Now, how do you distinguish a placer?

A. I have forgotten how I did define it.

Q. How do you define it now?

A. You mean now? I will ask you to be a little



(Testimony of Guy Sterling.)

more explicit. Do you want me to define what my idea is of all ground that is practically locateable as a placer?

Q. I want you to tell me what a placer deposit is, to define what you consider to be a placer deposit.

A. Well, in the original meaning of the word it is a secondary deposit, in a late geological age, of material by water.

Q. A deposit by water?

A. In other words, an alluvial deposit. [414]

Q. A deposit by water, you say?

A. Yes, sir; carried from some distance and deposited by water, and perhaps in water, but not necessarily.

Q. Now, in that respect, so far as that particular element of the definition is concerned, this deposit of calcium phosphate, if it were horizontal, would meet that requirement, would it not?

A. It would meet it to that extent.

Q. So far as that element is concerned?

A. Merely to that extent.

Q. So far as that element is concerned it would meet it if in a horizontal position. As a matter of fact, a placer is every kind of a deposit which is not a lode, or which is not a deposit such as is taken up under one of the modifications of the placer law?

A. Now, you are speaking of the law—I think that is right.

Q. It has a very broad signification in that respect?

A. Yes, sir; because it is applied to salt, quarries and to a number of special deposits.

(Testimony of Guy Sterling.)

Q. Now, when you speak of this calcium phosphate being in place, a horizontal deposit is in place, isn't it?

A. To use the word "in place" in its legal significance, I would say a horizontal deposit was in place if it was the original place in which deposited, had never been moved from some other place to that place of deposit.

Q. Isn't it true that these lode formations that are known and accepted to be lode formations, have been moved into their present position by convulsions of the earth? [415] A. I think not.

Q. Is not that the geological theory of it?

A. No; I never heard that they was moved there by convulsions of the earth.

Q. Well, what condition then, eruptions?

A. Generally, one way at least, and a very common way, and really it is a theory accounting for the deposition of mineral in a vein, is that it has been brought there by either hot or cold water, and through chemical reactions deposited there.

Q. Yes; but so far as rock in place is concerned, and talking about rock in place, you have stated horizontal rock would be considered in place, if it had never been moved, have you not? A. Yes, sir.

Q. And therefore a lode rock which has been moved by some eruption, and which came into its present form by eruption, under your definition, could not be a lode, and could not be in place because it had been moved?

A. Not in the sense that I spoke of, because it is

(Testimony of Guy Sterling.)

in the vein; it is in the form of a rock, although it may be ore.

Q. I am not talking about ore; I am talking about rock in place.

A. All right; we will call rock ore or ore rock.

Q. I say if it is in place in the vein, that is the place in which the elements and material in which that is found combined in the form of rock or ore; and if it was moved from there afterwards by eroding effect of water, or some other cause like that, and deposited in another place, I would say [416] in the other place it was a placer.

Q. You drift off into a placer, but I am not asking you about a placer, Mr. Sterling. I am trying to get your idea of what rock in place is.

A. Well, before it is moved from the fissure vein and after it had become rock or ore in the vein, I would say it was in place.

Q. Now, then, if there came some internal force that should twist or create in that rock a fault, by reason of that movement it could not be in place then, simply because it had been moved?

A. It might be in place between its walls, although it would not be in the exact spot on the earth in which it was originally deposited.

Q. Would it be rock in place?

A. Yes, sir; if it was between walls.

Q. So that if a horizontal deposit is moved, it would be in place after the movement, just the same as this deposit would be in place after movement, would it not? A. Yes, sir.

(Testimony of Guy Sterling.)

Q. Certainly. A. Yes.

Q. Did you ascertain the dates when you made these reports?

A. I find I made this Lorine report, as I stated before, at least the date I turned it in to the Surveyor General was about the 19th of May, 1908.

Q. You had the interest in these claims in 1906, at that time, did you say?

A. No; I did not say that. I say I began my examination and work on the Bradley claims in 1906. [417]

Q. When was it you made the survey for this man?

A. Crownholm?

Q. Yes.

A. I surveyed these claims for him on the 28th or 29th day of September, 1907, but I had no interest in them when I surveyed them for him.

Q. Did you have an interest in them subsequently?

A. I got the interest in them subsequently, subsequent to this report.

Q. You are positive that the time you acquired the interest in these claims was subsequent to this survey of the claims?

A. Subsequent to the time I surveyed for Mr. Crownhold.

Q. Subsequent to the filing of this report did you obtain your interest in these claims?

A. Subsequent to the filing of that report?

Q. Yes.

A. No; I am not positive about that, but I think I became interested in this before that report was filed;

(Testimony of Guy Sterling.)

I am not absolutely sure, though.

Q. That is the best of your judgment?

A. I am not absolutely sure, because I went up and down in that country so many times.

Q. Is there any way that you could determine that?

A. Yes, sir; I can determine it absolutely.

Q. Can you do it from any data that you have at hand at this time, so that we could tell?

A. I believe Mr. Jack may have something here that would throw some light on it.

Mr. BUDGE.—I would like to know, Mr. Jack, if you can ascertain that.

(Mr. Jack hands paper to witness.)

A. Yes; I am satisfied I had an interest in these claims before—let us see, March—well, it amounts to that, that [418] I became interested, at least potentially, in those claims about the time I filed that report?

Q. And before it was filed?

A. You may call it a little before, that I was interested potentially, because I expected to be interested in them.

Q. Can you tell me whether or not you had an interest, or possessed an interest, whether potential or not, before the report was filed?

A. I can't tell you absolutely, because it is necessary, I imagine from what you say, to be very exact about it. I know that I made these examinations and came to the conclusions in that report long before I had an interest in the claim, but at the time I filed the report, as I said there, I was interested in it, or



(Testimony of Guy Sterling.)

expected to be very shortly afterwards.

Q. And it may be the fact, so far as you now recollect, that at the time the report was filed you did possess this interest?

A. It may possibly be, in some of them.

Q. Had you that—

A. It was not in my name, but I say I expected to purchase an interest in them.

Q. And did, as a matter of fact, thereafter, if not before the report was filed?

A. Yes; if you want to show that I was interested in this ground, it is just the same; I expected to be interested in it.

Q. You regard it just the same?

A. I regarded it just the same; I expected to be interested in it. [419]

Q. Now, then, how long did you hold these claims, Mr. Sterling, the interest which you had?

A. I held it a little while, and then I think they were practically abandoned and then taken up again.

Q. Did you take them up again?

A. No; Thure Crownholm took them up for Frank Stephens and then I purchased an interest of them and they held it—we held it altogether about probably six or seven months, and sold it.

Q. Do you care to state to whom you made this conveyance?

A. It was made—we made our conveyance in the first place to the Union Phosphate Company, I think; that is, we sold them a part interest in the ground.

Q. Who did you sell to afterwards?

A. Then, we sold our interest afterwards to

(Testimony of Guy Sterling.)

Duffield and Jeffs.

Mr. DEY.—In the matter of the testimony of Mr. Charles Hoff, we do not want to keep him here to read and sign his deposition; will you waive that?

Mr. BUDGE.—Yes; and I was about to ask you to waive the reading by and the signatures of all of our witnesses to their depositions respectively, to be taken by Mr. Hamer in Pocatello, and we will agree to do the same as to all your witnesses.

Mr. DEY.—Yes; we will agree to that.

Q. Mr. Sterling, did you, in the examination of this Crawford Mountain here, and in the area covered by the Japan and China [420] lode claims and the Fryerson lode claim, the Montpelier group of claims, as shown on Exhibit 1, discover within the boundaries of any of those claims, or in proximity of any of those claims, close proximity, any deposit of any igneous rock? A. No; I think not.

Q. In other words, that section of country is not and does not contain igneous rock formation?

A. I have not seen anything of that kind. Once or twice I thought I saw some, but I decided afterwards there was not any.

Q. Now, one more question, and I think I am through. I will ask you whether or not you stated in your report that this deposit of calcium phosphate extends from some given point in one direction two miles, and in another direction approximately ten miles?

A. I think I stated that with reference to the Lorine lode.

Q. Well, it is practically, is it not, the same forma-

(Testimony of Guy Sterling.)

tion as this anyhow?

A. Yes, sir; it is a part of it.

Q. That is what I say. And what would you say as to the general extent along what you call the strike of this deposit in which these claims are all situated?

A. I have stated in my direct testimony, I think, that I thought it was about ninety miles approximately from the Obey lode to the southern end of the deposit, in the Crawford Mountains; that is about as far along what we call the strike of the deposit as I have been.

Q. Now, calling your attention to your examination of these [421] claims when you were over there with Mr. Wilson, you have stated in one place you had discovered some strippings on the top of the deposit, some 800 feet in extent. Where is that?

A. That is in the northerly part of the Obey lode, and shown on Exhibit No. 1.

Q. The northern part or southern part?

A. The Obed lode is on Exhibit No. 1.

Q. Yes; in the Obed lode, and within what is shown up here as the Inman and Winfield placers?

A. Yes, sir.

Q. Now, there is another point which was 300 feet. Where was that?

A. I think that was here on the Wayne lode; that was my guess of the distance—well, there was some also in the Obey lode, I think I mentioned.

Q. What extent was that that you mentioned?

A. Well, I guessed at it.

Q. Just a guess?

A. Just guessed the distance. We did not measure

(Testimony of Guy Sterling.)

the distance. I will give you just what I guessed it at. I have got it here from the tunnel No. 4 to the Obey discovery as about 450 feet of the lower part of the phosphate series that is stripped, and the outcrop of the phosphate rock in place is clearly shown in the stripped ground.

Q. Now, when you speak of the vein of calcium phosphate, you refer, do you not, to the lower bed of phosphate rock next to the calcium carbonate deposit?

A. When I speak of the vein I generally speak of it meaning the vein of phosphate rock that is exposed; or if it is more than one vein I mean those two veins, and it may be [422] either at the top of the series or at the bottom of the series; it depends entirely on where it happens to be exposed.

Q. Do you call the deposit, the entire deposit between the chert, the overlying chert and the calcium carbonate, as the vein between the chert, overlying chert and the calcium carbonate?

A. Do I call it what, please?

Q. A vein?

A. No; I call that, as I understand you, I call everything between the hanging-wall of the series and the footwall of the series, the series of alternating beds of phosphate rock, and each one of those beds is bounded by what I have spoken of in general as limestone.

Q. And each one of those beds has its walls defined? A. Yes, sir.

Q. Just the same as the series has well-defined walls of chert and calcium carbonate?

(Testimony of Guy Sterling.)

A. Yes, sir.

Q. But do you know whether there is more than one deposit of calcium phosphate that is commercially valuable? A. More than one bed?

Q. Yes; more than one bed. A. Yes, I saw—

Q. I mean on the Montpelier group.

A. I would not undertake to say definitely about that; I think in one—I have the impression, and that is all it is—that there were exposures—no, I don't think that was on the Montpelier group; I don't think that I saw more than one, what appeared to be a bed of phosphate rock, which was of commercial value, but I would not say that there were not any more. That is all I remember of seeing. [423]

Q. That is what I am asking you for, from your own observation only one?

A. Yes, sir; that is all I remember.

Q. Therefore the other beds of phosphate rock would not be termed ore bodies?

A. Not if that was the only one; I would not call anything that has no commercial value an ore body.

Q. So that the ore body in this particular series on the Montpelier group at least is simply the lower bed?

A. Well, it might be—I don't say it is so, because my examination did not go deep enough for that.

Q. I am asking you simply to state, and I don't want anything else, but simply what you know from your own observation.

A. Well, from my own observation, as I say, I don't remember of seeing in any place more than one bed that appeared or looked to be ore, but I will look



(Testimony of Guy Sterling.)

through my notes so as to be sure about that. I won't say positively, but I am quite sure, at least I don't remember of seeing any more than one vein of what appeared to be phosphate rock, that was exposed, and some of those were 5 to 6 feet, and some I have got noted here were 7 feet thick.

Q. So that what you term to be the walls of the ore body in these claims, on these claims, are of calcium carbonate at the bottom, and shale or sandstone at the top?

A. Well, in this particular examination I think that generally both walls of the bed of phosphate rock was limestone, although sometimes it was shale and soft.

Q. I am talking about the lower beds.

A. Of the series? [424]

Q. Yes.

A. Well, that, as I remember it, was a rather silicious limestone, a cherty limestone, the hanging-wall of the series, or what I call the series—I mean the footwall, what I call the footwall of the series.

Q. What is it of the hanging-wall?

A. The hanging-wall of the series?

Q. No; I mean the lower bed of the phosphate rock.

A. I have got it stated in my notes, and as I remember it it was generally what I considered limestone, although sometimes it was shale.

Q. Well, did the deposit of silicious limestone 3 or 4 feet in thickness—

A. Now, you are speaking, of course, of this group that belongs to the Lorine, a different proposition.

(Testimony of Guy Sterling.)

Q. A different proposition?

A. Different conditions exist.

Q. Then, tell me what it is here—let me shorten it—at Montpelier, what you termed the hanging-wall and footwall, of what you say is the only commercially valuable deposit of the series, is calcium carbonate?

A. I said it was the only valuable, commercially valuable deposit of the series that was exposed.

Q. That you saw?      A. That I saw.

Q. That is what I mean.

A. I see that the walls of that were what I call limestone, although it might have been very silicious, and may have been shaly.

Q. It was more silicious at the bottom, and not so silicious at the top. Is not that the fact?

A. I would not say about that definitely. [425]

Q. Now, you have spoken about the outcrop of this calcium phosphate along this deposit as the apex. Now, what do you mean by apex?

A. The outcrop of the vein on the surface of the earth.

Q. Is that the definition of the word apex, that it is the outcrop?

A. That is the definition, as I understand it, where the vein comes to the surface.

Q. Is not the apex commonly understood now as being the highest point on the claim?      A. No.

Q. The highest point where the outcrop is?

A. No; I don't understand it to be the highest point on the claim. It might have been an outcrop down in the bottom of the gulch, and another outcrop

(Testimony of Guy Sterling.)

on the mountain, away up in the air, and still both points would be on the apex of the vein, as I understand it.

Q. That is your understanding of apex?

A. Yes, sir.

Q. Do you know of any vein of what is commonly known as—any lode or vein, commonly understood and accepted as a lode or vein, to have an apex like what you term here to be an apex, for the extent that this has?

A. No; I don't know of anything that has such a large or long exposure of apex, but I know of a great many exposures of the apex that are similar in every other respect.

Q. Have you ever visited the deposits at Georgetown, north of Montpelier, about twelve or fifteen miles? A. No; I don't think I went there.

Q. You have never seen those?

A. No; I am sure I did not go there. This was all, this trip to the Crawford Mountains that I had anything to do with, with those gentlemen. [426]

Mr. BUDGE.—I think that is all.

Redirect Examination.

(By Mr. DEY.)

Q. When you referred to this section of the deposit that was of commercial value, had you reference to the present condition as to mining, transportation and treatment?

Mr. BUDGE.—We object to that as leading.

A. Yes, more particularly, although—

Q. What do you mean?

(Testimony of Guy Sterling.)

A. Although I had a little broader idea than that, such rock as might, within a reasonable length of time, become commercially valuable.

Q. You also took that into consideration, did you?

A. Yes, sir.

Q. What do you mean by a reasonable length of time? A. Well, say ten or twelve years from now.

Q. What do you know about what will be the conditions then?

A. I don't know; it is just a matter of judgment.

Q. How did you come to make the report on the Bradley claim, that you have testified to upon cross-examination?

A. I was employed by the Bradleys, I think in 1906, to survey their claims for patent, and at that time they explained the situation to me, and asked me whether I thought they ought to be located as placers or lodes; and they explained to me that there was some controversy among the people in that country as to how they should be located; and they also told me in regard to the controversy over the Waterloo placer; and after getting their description of the formation, and going on the ground, I told them that I thought they ought to be [427] located and carried to patent as lode claims, and subsequently I surveyed them for the Bradleys for patent, and they went in the course of time to the Land Office in Washington to be patented, and when they came to this last stage I think the Union Phosphate Company and the San Francisco Chemical Company both protested against them being patented as lode claims, and the Department of the Interior asked me for



(Testimony of Guy Sterling.)

those reports in order to give them information upon which they could decide whether or not they could be patented as lode claims; and I simply wanted to call attention to the fact that my opinion in regard to how those claims should be located was formed independently and long before I had any intention of being interested in any claims whatever.

Q. And before you had any interest?

A. Before I had any interest, or intention or expectation of having an interest.

Cross-examination.

(By Mr. BUDGE.)

Q. But nevertheless, as you have stated, the report which you made was, according to your best recollection, filed after you had become interested?

A. Either after I had become or after I expected to become, which is all the same.

Q. It is all the same.

A. As to any influence it had upon my mind as to the formation of my opinion, as my opinion was formed long before that. [428]

And thereupon the further taking of the depositions and testimony in this cause was, by consent of said parties, by their respective solicitors and counsel, adjourned, to be resumed on Saturday morning, the 20th day of May, 1911, at the hour of 10 o'clock.

Saturday, May 20, 1911, 10 A. M.

At this day come again said complainants, by Messrs. C. B. Jack and Charles C. Dey, their solicitors and counsel, and the said defendant, by Jesse R. S. Budge, its solicitor and counsel, also comes; and



(Testimony of Guy Sterling.)

thereupon the further taking of the depositions on the part of said complainants in this cause is resumed, pursuant to adjournment.

**[Testimony of Guy Sterling, for Complainants  
(Recalled).]**

GUY STERLING, a witness produced by the said complainants, heretofore duly sworn, being recalled, further testified:

**Cross-examination.**

(By Mr. BUDGE.)

Q. Mr. Sterling, I will call your attention again to the report which you stated you made to the Government. I will ask you [429] whether or not, at the time you filed this report, you notified the Government, or called to their attention the fact that you were interested in these lode claims?

A. No; because I did not own any interest in it at that time, and the interest that I did finally acquire was purchased.

Q. Well, you said, did you not, that you were not positive whether you did own it at that time or not?

A. I said I did potentially—that is, I expected to become interested in it, and so far as any influence which my interest would have in the thing, it was just the same as though I actually owned it, but it had none at all.

Q. Did you notify the Government that you were potentially interested? A. No, sir.

Q. You did not call that to their attention at all?

A. No; I will state furthermore that what they called on me for was merely a statement of facts,

(Testimony of Guy Sterling.)

and this was merely a statement of facts, except in regard to the theory of the deposition of the phosphorus, and there was no conclusions on my part at all.

Q. The report which you made the Government has been printed, Mr. Sterling, as a Government report?

A. No; not any further than you see in the hearings.

Q. You mean in the hearings on phosphate lands before the Committee on Public Lands in December, January and February, 1909, wherein the bill of Mr. Mondell was up for consideration, as to the manner of giving these lands to claimants by lode or placer patents?

A. I believe that was it; it was introduced by the Bradley Brothers' lawyer, their attorney, who was at that [430] hearing, Mr. Payson.

Q. Payson?

A. Payson; yes, sir; it was introduced by him; it was not introduced by the Government. It was introduced by him, as I understand it.

Q. That is correct. You are right about that. It was introduced by Mr. Payson. A. Yes, sir.

Q. Now, these reports which you have stated you have read on phosphate, the Gale and Richards reports and the Weeks and Ferrier reports, which I understood you to say were the only reports that you can remember of having read, were Government reports? A. Yes, sir.

Q. They are both published by the Government?

(Testimony of Guy Sterling.)

A. Yes, sir.

Q. And in both of those reports, Gale and Richards, and the Weeks and Ferrier reports, the conclusion reached by the geologists making those reports was that those claims were properly locateable as placer?

A. Now, I don't pretend to be familiar with those reports at all, but the impression I got from those reports is that they thought, the author appeared to think,—that owing to the extralateral rights which go with lode claims, that if these claims were located under the lode law they granted too much right, and furthermore, that they were not strictly placer claims, and the claims of lands ought to be located under some special law. That was the impression I got from those reports.

Q. Don't you recall that they came to the conclusion that as the [431] law now stood, inasmuch as there was no special act under which this could be done, that a placer was the more proper way of taking them?

A. I did not get that impression, no; and even if they did come to that conclusion, I am perfectly willing to acknowledge it, because it would not make any difference; it was a mere matter of opinion, anyway.

Q. Let me call your attention to Gale & Richards' report, at page 78. A. Yes.

Q. This, as I say, on page 79, is as you state, is it not, that they conclude that they are not properly veins or lodes, or typical placers, either one?

Mr. DEY.—We object to this as not proper cross-

(Testimony of Guy Sterling.)

examination, and also as wholly immaterial, incompetent and improper, to examine the witness on some *ex parte* opinion of Gale and Richards.

Now, if there is no objection, I would like to read the sentence I had in view in answering your question.

Mr. DEY.—If anyone wants it I don't care. I don't want it.

A. There is only one sentence I wanted to read, the one I had in view in the answer to Mr. Budge's question.

Mr. DEY.—Make any explanation you see fit.

A. It says, "Under the strict interpretation of the present law, and with the recognition of the true character of the western deposits, it may be held in the courts that they must be considered as covered by the lode law. It is to be [432] hoped, however, that further patents in these western fields may be withheld until equitable adjustment of the existing difficulties can be provided."

Q. (By Mr. BUDGE.) Where is that?

A. That is the last sentence on page 80, in the paragraph headed, "Title Granted in Western Phosphate Fields," the last two sentences in that paragraph.

Q. Now, to make the explanation complete, Mr. Sterling, just read the entire paragraph there.

A. I have.

Q. That is one paragraph at the top of the page.

A. Page 80, under the heading, "Title Granted in Western Phosphate Fields.

(Testimony of Guy Sterling.)

“Title has passed in two cases in the western phosphate fields, the Waterloo claim at Montpelier, Idaho, and the Bradley group of claims in the Crawford Mountains, Utah. The Waterloo patent was granted as a placer, and ~~the~~ Bradley claims were later allowed to patent as lodes. As previously stated, prior to the granting of the Waterloo patent, all entries for phosphate lands were made in the Florida fields, and presumably covered deposits of true placer type, but it appears that the distinction between these deposits and the phosphate beds of the western field was, perhaps, not clearly brought out at that time. Under a strict interpretation of the present law, and with the recognition of the true character of the western deposits, it may be held in the courts that they must be considered as covered by the lode law. It is to be hoped, however, that further patents in these western fields may be withheld until an equitable adjustment of the existing difficulties can be provided.” [433]

Q. As you have further stated—

Mr. BUDGE.—Did your objection run to this first question which was propounded?

Mr. DEY.—It ran to the examination concerning Gale and Richards’ opinion.

Q. And as stated, one of the reasons why the geologists have concluded that a lode was not the proper form of location of extralateral rights?

A. Well, this is what he gives here as his objection.

Q. Well, that, as I say, is one of the objections



(Testimony of Guy Sterling.)

still. Now, have you read the report of F. B. Weeks?

A. Yes, sir; that is the one I have.

Q. This one by him alone?

A. I don't think I have read that, Mr. Budge.

Q. Known as Bulletin 340-K, 1907. Now, one more question, Mr. Sterling. In relation to this, where calcium oxide is used as a fertilizer.

A. Calcium oxide?

Q. Did you not testify yesterday that it was used commercially?

A. I have testified yesterday that calcium sulphate was used as a fertilizer; you may call it—

Q. Well, that is commonly called gypsum?

A. Yes, sir.

Q. But I am talking about calcium oxide. Calcium oxide is used as a fertilizer, I mean the rock alone? A. Limestone is, yes.

Q. Slack lime?

A. Yes, sir; I suppose slack lime might be used too.

Q. Now, then, that is used for the benefit which will accrue to the land from the action of the calcium on the land? [434]

A. Well, I must state that I do not—I am not absolutely sure that I know of any calcium oxide. You mean hydrate of calcium?

Q. Well, it is slack lime.

A. Well, I don't think it is proper to call it calcium oxide.

Q. If that is not the proper term for it, and if I

(Testimony of Guy Sterling.)

have given it wrong, answer as to, whatever it is.

A. Slack lime might be used just exactly as limestone is used, to sort of neutralize the—

Q. Alkali?

A. No, sir—well, it might be used to neutralize some of the acids to correct any acidity there might be in the soil.

Q. And as a matter of fact, it is the calcium in it that has that effect?

A. Well, calcium with an earthen alkali, and sometimes with some other alkalies, will make a chemical combination and have a decomposing effect.

Q. When slack lime is used for the purposes stated, isn't it true that it is for the purpose of sweetening the land, so to speak?

A. That is why it would be used to neutralize the acidity.

Q. And therefore it is the calcium in it that has that effect, hasn't it?     A. Yes, sir; partly.

Q. And the calcium phosphate would have a like effect, would it not?

A. Why, I don't know, I must say, whether calcium phosphate could be broken up by any other alkali; it might have that effect.

Q. I am speaking about calcium phosphate, as it is used as a fertilizer. Would not the calcium unite and operate [435] to a degree in the same way that the calcium in this line would operate?

A. As I say, I don't know; I don't think so.

Q. Why do you say you do not think so?

A. Because calcium hydrate, that which is a com-

(Testimony of Guy Sterling.)

bination of hydrogen and oxygen and calcium, would act upon, for instance, some of the sodium salts, or potassium salts, or with some weak organic acid, where calcium phosphate would not be effective.

Q. Do you mean to say that this calcium that is in the calcium phosphate would be of no benefit whatever upon the land?

A. Not in the sense that—

Q. Would it in any sense?

A. It would be so very slow—it is so insoluble under ordinary conditions that for any practical effect I would consider it useless.

Q. But after the treatment?

A. After the treatment, that is another matter.

Q. Well, then, after the treatment, as you have explained the treatment, as I understand it, after the treatment has been given to the calcium phosphate rock, then, would not the calcium in that rock have a beneficial effect as a fertilizing element on the land? A. After the treatment?

Q. That is what I say.

A. The calcium—

Q. Can't you answer that yes or no?

A. I am going to. After the treatment the calcium phosphate is changed into different forms of calcium phosphate, some of which is soluble, and a part of the calcium is changed into calcium sulphate, that is gypsum, by this treatment, [436] and that, of course, the gypsum so far as it extends, would have just the same effect there as if it was applied raw.

(Testimony of Guy Sterling.)

Q. How about the balance of the calcium that is not changed to a sulphate?

A. It is still in combination with the phosphoric acid, and it is in soluble shape. My opinion would be it would not have this neutralizing effect, because they are acid calcium phosphates.

Q. And it is your information, and do you state positively, that this treatment changed this calcium into calcium sulphate? A. Part of it.

Q. Did you analyze it?

A. I know it from the chemical formula.

Q. You know it from the chemical formula?

A. Yes, sir.

Q. And that this calcium in this rock, after its treatment, has no effect upon land at all beneficially?

A. I did not say that at all. I said it has no neutralizing effect.

Q. I am not asking about neutralizing effect. I am asking if it has any beneficial effect, and you will not answer my question.

A. I say I doubt whether calcium itself, except that which is changed into gypsum, has any beneficial effect.

Q. Would you say that any portion of it would have any beneficial effect?

A. The part changed into gypsum would have some beneficial effect.

Q. What proportion is that? You don't know?

A. Yes.

Q. What proportion?

(Testimony of Guy Sterling.)

A. Why, I can tell it by referring to a work on chemistry.

Q. Well, state your opinion without such reference.

A. I say there is a lot of formula which would be useless [437] for anybody to attempt to remember.

Q. I did not ask you that. I asked you if you know what proportion of a given quantity of sulphate or calicum phosphate would be changed to gypsum. Can you tell?

A. Yes, sir; I think I can.

Q. Approximately?

A. I think I can tell you; I think it is about one-third of the calcium in the calcium phosphate, presuming it to be the pure calcium phosphate and uniform.

Q. No; I am asking about this rock; that is what I am asking you.

A. Presuming that rock is pure calcium phosphate—

Q. Not presuming that, but what it is.

A. It has different grades.

Q. Take the grade that is here then.

A. I don't know without an analysis of some particular piece of rock, how much calcium phosphate there is in it.

Q. Take the analysis of these samples concerning which you have testified; consider those samples. How much in quantity of that rock?

A. I have here before me, which I am using merely



(Testimony of Guy Sterling.)

for the purposes of illustration, the analysis of a piece of calcium phosphate taken from the Shoshone claim in the Bradley group.

Q. Have you got none here?

A. I have not a complete analysis of any of these. They simply give the calcium phosphate—this gives the whole thing, all the ingredients of the rock, and undoubtedly there are a great many other pieces just like this in the whole country. This is just merely used for illustration. [438]

Q. Go ahead and let us have it.

A. This happens to be a high-grade piece of rock. It carried 81 per cent of calcium phosphate, and 11 per cent of carbonate of lime, and then there was a little magnesia, a little iron, and a small amount of insoluble material. Now, my opinion would be, when that was treated with sulphuric acid, that one-third of the calcium in the 81 per cent which goes to make up the calcium phosphate in this sample, would be changed into gypsum, and that all of this 11 per cent of calcium carbonate would be changed into gypsum.

Q. So you would have there, in the 100 per cent of this rock, 27 plus 11, equalling 38, approximately, per cent of that rock which would be changed into gypsum, which would have some beneficial effect?

A. It would have, as I have before stated, a mechanical and perhaps a chemical beneficial effect upon the soil.

Q. Now, the other rock from any other portion of these claims which are in question in this contro-

(Testimony of Guy Sterling.)

versy, would have the same proportionate benefit, considering the quality of rock, that this would have?

A. If they have the same proportion of ingredients it would be just the same, but we have to keep in mind all the while that it requires that chemical treatment to bring about that condition.

Q. What is that you say?

A. We have to keep in mind all the while that it requires that chemical treatment to bring about that condition.

Q. Don't you know, Mr. Sterling, that this phosphate rock in [439] this particular rock perhaps out of these claims, and phosphate rock such as this is, is used in its natural condition just as it is taken out of the ground?

A. I don't know, but I have heard of it, but I don't know of any company that makes a business of preparing and using and selling raw rock in any quantity in that way directly.

Q. There may be some, may there not?

A. Yes, sir.

Q. And if it was so used it would be beneficial?

A. In time, but there would not be anything beneficial owing to the lime or gypsum; it would be simply during the gradual dissolving of the calcium phosphate by the elements.

Q. And that would be beneficial?

A. Or that the phosphorus would become in such a condition it would be taken up by the plant, and the calcium would undoubtedly be set free and have a neutralizing effect upon the soil.

(Testimony of Guy Sterling.)

Q. To that extent it would be beneficial?

A. Yes, sir.

Q. As it dissolved it would have that beneficial effect itself in time? A. I think so.

Redirect Examination.

(By Mr. DEY.)

Q. Referring to this phosphate rock, is it not  $P_2 O_5$  that gives it a commercial value?

A. Yes, sir; that is the basis upon which it was always spoken of, and with which it was regarded as a business or commercial proposition.

Q. How about its being the basis for which it is mined? [440]

A. It is also the basis upon which it is mined; it is the basis upon which all phosphate rock gets its value, wherever it may be.

Q. You on cross-examination were describing at some length the uses of phosphorus in making fertilizers. Are there other uses for phosphate?

A. Oh, yes; all of the phosphorus we have that is used in the arts and manufactures is extracted from this phosphate rock; that is practically all of it. I suppose there may be a very small proportion that is extracted direct from bones, but the vast quantity of it comes from phosphate rock.

Cross-examination.

(By Mr. BUDGE.)

Q. This  $P_2 O_5$ ; that is simply phosphoric acid chemically?

A. It is phosphoric anhydrate; it is not really an

(Testimony of Guy Sterling.)

acid; it has got to have some hydrogen with it to make an acid.

Q. What does that express,  $P_2 O_5$ ? What does it mean? A. Phosphoric anhydrate.

Q. You say it is in that form it is sold?

A. Upon the basis of the proportion of  $P_2 O_5$  in the rock that the rock is sold and valuable.

Q. Have you ever had any experience in selling phosphate rock?

A. I have not any, but you will find that in every list of quotations that is on record.

Q. I am not asking you that. I am asking you what your knowledge is.

A. I never sold or bought a pound of it.

Q. And never have seen it sold or bought?

A. No; I have not.

Q. And you have never, when you say it is the basis upon which it is mined, you have never mined any upon that basis, have you, or at all?

A. I have not mined it myself, but it is [441] almost common knowledge that that is the basis upon which it is mined, and I have had a great many assays made for the Bradleys, and that has always been the basis upon which we made the assays, to get the proportion of  $P_2 O_5$  in the rock.

Q. Now, what is there in addition—what is the difference between this  $P_2 O_5$  and phosphorus?

A. Just the difference between the combination chemically of oxygen and phosphorus, and phosphorus alone.

Q. Just the difference between the phosphorus

(Testimony of Guy Sterling.)

and this  $P_2 O_5$  is simply the addition of the oxygen?

A. That is the chemical addition of the oxygen.

Q. The chemical addition of the oxygen does not mean then, as you have heretofore stated, on the basis or for the phosphorus alone, but for  $P_2 O_5$ ?

A. Yes, sir; that is true. It is simply that chemically speaking for fertilizers, there is no occasion to separate the phosphorus absolutely by itself, and it is used in combination as  $P_2 O_5$ , which, as exposed to the air, very quickly becomes an acid itself.

Q. So that the basis upon which it is used commercially is because it is convenient, and because there is no use for phosphorus itself alone, in a commercial way, or in the fertilizer business commercially?

A. The value it has as  $P_2 O_5$  is due entirely to the fertilizer business; it is not due to that part of the business which manufactures phosphorus.

Q. And as a matter of fact it is not the phosphorus itself, but  $P_2 O_5$ . The phosphorus would not be and could not be utilized as a fertilizer, could it? A. Not without treatment. [442]

Q. Not without the combination accompanying it?

A. Not without treatment, and it would not be to combine it with water.

Q. So to speak correctly about it, the basis or reason which makes this calcium phosphate valuable for fertilizing purposes is the  $P_2 O_5$ , the combination of phosphoric acid with oxygen, rather than the phosphorus itself in the calcium phosphate?



(Testimony of Guy Sterling.)

A. No; I don't agree with that. I say phosphorus, if you have phosphorus alone, that every one would prefer to buy it that way; it is so easy to be converted into an acid that they would prefer it that way.

Q. Can you buy it alone?

A. Yes, sir; uncombined phosphorus is manufactured in a great many places, and you can buy it alone.

Q. Uncombined with anything.

A. Absolutely uncombined with anything, pure phosphorus.

Q. From what sources is phosphorus derived that is used for other than fertilizing purposes?

A. The rock calcium phosphate.

Q. Well, do you know what amount of phosphorus is annually produced?      A. No.

Q. Do you know what proportion is produced from phosphate rock?      A. No.

Q. Do you know whether any is?

A. Yes, sir—I only know by reading.

Q. Where have you read it?

A. Where have I read it?

Q. Yes.

A. I think I have a statement in here.

Q. Just refer to that.

A. I will look and see if I can find it. [443]

Q. I mean to give us the book so that the record will show the publication where that appears.

A. I will read this, if you have no objection here, an extract from Bulletin 315, prepared by, as I un-

(Testimony of Guy Sterling.)

derstand it, F. B. Weeks and W. F. Ferrier.

Q. Well, I don't want you to read the article itself; I want you to tell me where you have read that phosphate rock is mined—no, that phosphorus is taken from phosphate rock itself.

A. All right; in this bulletin I have just referred to, on page 482.

Q. Now, by the way, before you start to read the article—was that written by Weeks and Ferrier? Examine that a little more closely. Look on page 474.

A. No; it says it was written by George W. Stose, it is bound in the book.

Q. Give the title to the article.

A. Production by States. Phosphorus Ore at Mt. Holley Springs, Pennsylvania—that is a misleading title to the part I was going to read, because that is a general discussion of the different manufacturers and method of manufacture.

Q. That is the place that you refer to?

A. That is the one, yes.

#### Redirect Examination.

(By Mr. DEY.)

Q. What is it, Mr. Sterling, that you were about to read about the production, from the pamphlet or book you identified?

A. It was simply a paragraph in here showing—

Q. Read it.

A. Showing that one Company manufactures phosphorus from phosphate rock obtained from South Carolina, and giving an outline of the method

(Testimony of Guy Sterling.)

used in extracting the phosphorus. [444]

Q. Is there anything in there about the production?

A. Yes, sir; it does say at the bottom of the page—

Q. Read it.

A. At the bottom of the paragraph—

Q. Read it.

A. In regard to the production of phosphorus?

Q. Yes; that is the question you were asked.

A. It says in addition to the domestic production the United States imports annually thirty to forty thousand pounds of phosphorus, on which a duty of eighteen cents a pound is paid.

Q. Does that say the production of the United States? A. That is what it says here.

Mr. BUDGE.—It says importing here.

WITNESS.—It does not show what is produced in the United States; it don't say what is manufactured in the United States. The price in New York, the market price ranges according to the quality from 45 to 70 cents a pound.

Q. What year does that purport to have been written? A. 1906.

Mr. DEY.—That is all.

Mr. BUDGE.—That is all.

(S.) GUY STERLING. [445]

**[Testimony of William A. Wilson, for  
Complainants.]**

WILLIAM A. WILSON, a witness produced by the complainants, being first duly sworn, testified:

Direct Examination.

(By Mr. DEY.)

Q. Where do you reside?      A. Salt Lake City.

Q. What is your business or profession?

A. Mining engineer.

Q. How long have you resided in Salt Lake City?

A. Since about 1892.

Q. What preparation did you have for your profession?

A. I took a course in mining engineering at Columbia College, New York City, taking the degree of E. M.

Q. In what year did you take your degree?

A. That was in 1882 when I left the college.

Q. After taking your degree at Columbia College, what did you do?

A. I have been continuously engaged in the practice of my profession.

Q. Where?

A. In all the western states and Old Mexico, British Columbia, and have made a trip to Alaska.

Q. From 1882 down to the present time?

A. Yes, sir.

Q. Generally doing what, in the line of your profession?

A. Why, I started in with assaying, and have run mills, sampling mills and reduction mills; I have

(Testimony of William A. Wilson.)

been connected with mining ores, and with the examination of mining properties and of veins and lodes.

Q. Did you visit the mining ground shown on Exhibits "A" and "B," and Exhibit 1 on the blackboard?

A. Yes, sir; I have been on that ground.

Q. When?

A. Why, in 1909 I went to Montpelier, up and around [446] and near the Overton claim, and looked at the old workings there.

Q. What time, in October? What time in 1909?

A. That was in July, about July 9th, 1909; and then on October 29th, 1910, I started and made a very thorough trip over the claims shown on Exhibit 1 and also on Exhibits "A" and "B."

Q. (By Mr. BUDGE.) What date was that?

A. October 29th was when I made the last trip of inspection.

Q. The last trip was in company with whom?

A. In company with Mr. Sterling, Mr. Duffield and Mr. Hoff.

Q. What was the object of your visit to those properties?

A. To examine the claims and see whether there was a valuable deposit, and if so its relation to the country rock, its course and strike, and the material in the vein.

Q. I wish you would start in, Mr. Wilson, with the claims shown on Exhibit "A," and state what you found upon an examination of that property,



(Testimony of William A. Wilson.)

in respect to the formation or physical characteristics of the ore deposit, and the formations in which they were found, and what you did, fully.

A. On Exhibit "A"—this is in Wyoming. It is the Japan and China lode, which is approached from the valley by going up Raymond Canyon a ways, and then swinging off to the north. On reaching the southerly end line of the Japan lode I found several tunnels penetrating the mountains. They were in the solid mass of the mountain. I went into both of these tunnels, and in both tunnels found dark rock enclosed within well-defined walls, the walls standing about vertical, the wall on the east-erly being very silicious, and what you [447] would call a limestone, a very silicious limestone, and the wall on the west also a limestone, but not quite so silicious from my inspection of it. I also took a sample from this discovery tunnel, and had it assayed.

Q. Did you take the sample?

A. Yes, sir; I took the sample. That sample is numbered S-1 discovery of Japan, and went or carried—

Mr. BUDGE.—Never mind what it carried.

Mr. DEY.—We do not ask him to give the chemical analysis, but just the number.

What is the the number of the sample?

A. S-1, discovery Japan.

Q. S-1, discovery Japan. Who took that sample?

A. I took that sample.

Q. From what place did you take it?

(Testimony of William A. Wilson.)

A. From the discovery of the Japan lode in the tunnel and off in a little cross-cut here showing the discovery marked at the mouth.

Q. What was exposed at the discovery?

A. This tunnel exposed a series of alternating limestone beds and a dark mineral (very conspicuous) and shaly rock. Some of these alternating beds are very silicious. The dark rock I took for the ore, and took a sample of it, took the best of it. That sample covers five feet.

Q. It covers what distance?

A. That was for the five feet.

Q. Five feet?      A. Yes, sir.

Q. What did you do with it?

A. I proceeded—

Q. What did you do with the sample?

A. That sample was delivered to—I kept possession of it and brought it down [448] to Salt Lake and delivered it to the assayer.

Q. You kept it in your possession?

A. Yes, sir.

Q. And to whom did you deliver it?

A. R. H. Officer & Co.

Q. For what purpose?

A. For the purpose of testing and ascertaining the percentage of  $P_2 O_5$  in that sample.

Q. What do you mean by  $P_2 O_5$ ?

A. I mean the combination of phosphorus and oxygen that is contained in this mineral as the assay shows.

(Testimony of William A. Wilson.)

Q. And who did you deliver it to at Officer & Company?

A. To Mr. Jerry Black, I believe, in their office.

Q. You received from him the return or certificate of the result? A. Yes, sir.

Q. Please produce it.

(Witness produces paper.)

Said paper was marked "Exhibit 'C,' J. W. C."

Q. This Exhibit "C" is the paper?

A. Yes, sir.

Mr. BUDGE.—I understand that this only purports to show, this certificate of assay, Exhibit "C," only purports to show the percentage of  $P_2 O_5$ , and not the entire substance that is contained in this deposit?

Mr. DEY.—I so understand.

Mr. BUDGE.—That is correct, is it?

WITNESS.—That is correct.

Mr. BUDGE.—I have no objection.

Mr. DEY.—If counsel consents we will offer this without further proof.

Mr. BUDGE.—Yes.

Said certificate, marked "Exhibit 'C,' J. W. C.," is hereto attached and returned into court as a part of this report. [449]

Mr. BUDGE.—If you have got the other certificates, Judge Dey, covering all these samples that were taken by Mr. Wilson and Mr. Sterling, to save time in going over them, you can have them marked now, and if it is a fact, state that they were taken in the same manner in which this was taken, and let

(Testimony of William A. Wilson.)

them go in without further proof, if you wish to.

WITNESS.—I did not know the Columbia was wanted, and did not take a sample of the Columbia. Now, Mr. Hoff came down with a sample of that, and I sent that around to Officer & Company and had that assayed as a sample of the Columbia.

Mr. BUDGE.—If you say that was taken from the Columbia—

Mr. DEY.—It was taken from the Columbia. These certificates are from R. H. Officer & Company, marked Exhibit “C,” J. W. C.; also Exhibit 36, J. W. C., and Exhibit 37, J. W. C., and I understand counsel we will offer them in evidence, with the understanding that counsel waives proof of the same by Mr. Officer.

Mr. BUDGE.—Yes; with the understanding that the certificates purport to show only the percentage of  $P_2 O_5$ , the phosphoric acid and oxygen.

WITNESS.—Phosphorus and oxygen.

Mr. BUDGE.—Phosphorus and oxygen and nothing else than those substances.

WITNESS.—That is all.

Said exhibits so marked are hereto attached and returned into court as a part of these depositions.  
[450]

Q. Now, you will have those before you, and you can use them as you proceed.

A. Sample S-1 from the discovery of the Japan gives a percentage of  $P_2 O_5$  of 32.3 per cent.

From these tunnels I proceeded along the side of the mountains of the Sublette Range. This range

(Testimony of William A. Wilson.)

has a northerly and southerly trend. In passing over the end common line between the Japan claim and the China claims I hunted over the surface to see if I was still following the float from this vein or lode, and I found practically the same character of phosphate rock from which I had taken the sample in the tunnel. In following over the surface of the claim to the east, at times the jutting strata showed very plainly the limiting-walls, and I pursued a zig-zag course to see the limit of all the phosphate rock or phosphorite that I could find. I did not find much until I came to the cuts at the northerly end of the China lode. In these tunnels the phosphorite ore is again shown.

Q. In place?

A. In place, but the country is rather broken and flattened out. It dips 45 degrees westerly here, with a northerly and southerly strike.

Q. Now, when you say "here," what place is that on the map?

A. The discovery tunnel of the China.

Q. Now, as you go along please give the physical conditions, and the character of your examination.

A. The inspection or examination, as I have outlined it here, is of the same character that I did on all the ground. [451] I would go to all the openings, and observe the walls and the contents of the lodes.

Q. If you will take it up and go through it, as you have started, by systematically giving all the details as you go along, it will save time.



(Testimony of William A. Wilson.)

A. The details are all thoroughly in my mind, and I made very short notes.

Q. Well, we want them on paper now. I want the information which you derived in reference to the vein or lode itself, as well as the dip and strike, and all the physical characteristics.

A. That is what I have given as to the Japan. Now, I have got to the discovery of the China lode, and in the discovery tunnel of the China lode I took sample S-2, and it carried or contained 11.2 per cent of  $P_2 O_5$ : Then, I came around the mountains to the south—

Q. Just before you go to that now, you have stated that there was a series of strata, some of them containing this mineral. Will you make it clear just the condition that is shown in the China and Japan.

A. Well, taking the discovery of the Japan lode, in entering this tunnel here the different strata of mineral and the shale or silicious rock lying between them is found standing vertically.

Q. Can you give the width or breadth?

A. This tunnel is 70 feet long.

Q. Does that cross-cut it, or is it driven on the strike?

A. In the Japan tunnel it follows in 75 feet; the note I have got is course north 70 degrees east for the tunnel, and the course of the vein is north 20 degrees west, dipping vertically. [452] Took sample of this in this tunnel in drift to the north, in 10 feet. Sample taken in place 5 feet—sample S-1. This tunnel cuts several parallel veins. This shows the

(Testimony of William A. Wilson.)

fissure running east and west. From mouth of tunnel see vertical wall on east of rock in place, and also on west of rock in place.

Q. In your opinion what constitutes the vein or lode?

A. This series of phosphorite layers that I saw in this tunnel, and with the boundaries, between the wall on the east and the west.

Q. What is the breadth of the series that you refer to?

A. Well in no place is it sufficiently developed that I could see the entire breadth, but I would say I could see about 60 feet.

Q. Your judgment is some 60 feet?

A. My judgment is I could see some 60 feet in breadth.

Q. And bounded by the walls you have described?

A. Bounded by the walls I have described.

Q. How do you determine the difference between the walls, as you call them, and this phosphorite, or mineralization?

A. Where the mineralization ceases I call that the wall; that is where I have no more phosphorite appearing in the vein, I come to the wall rock. That is the limit of my vein and lode.

Q. And is that the only explanation you can make as to the line of demarcation?

A. Yes; that is clearly the line of demarcation.

Q. Where the material changes?

A. The material changes from phosphorite to wall rock of silicious limestone—sometimes not so silici-

(Testimony of William A. Wilson.)

ous. It [453] varies in its character. It is sometimes cherty.

Q. How is it in respect to color?

A. The color—this is a kind of blue lime on the hanging, and the mineral itself very dark, and sometimes the limestone is dark blue.

Q. What is the color of the footwall?

A. The footwall is generally a lighter colored limestone, a kind of a grayish, silicious limestone.

Q. From your examination what is your opinion as to whether or not it is the same lode throughout the length of the China and Japan?

A. From my examination I would consider it the same lode passing through the China and Japan claims from end to end.

Q. And that is a lode upon which the discoveries of these respective claims appear?

A. Yes, sir; the discoveries are located on this vein or lode.

Q. Now you may proceed.

A. Leaving the Japan and China lode, I go southerly down on the westerly side of the Sublette range, and over to York Gulch to the north end of the Fryerson claim.

Q. Shown on Exhibit—

A. Shown on Exhibit "B." This end line is just southerly of the gulch, and there is a long stripping along the face of the gulch there, the southerly face, and in this stripping is the discovery of this Fryerson claim, and from near the discovery I took sample S-3 of the dark rock. [454]

(Testimony of William A. Wilson.)

Q. Did you take it in the same manner as the others?

A. In the same manner as the others, from good phosphorite ore, and from a thickness of 4 feet. This sample S-3, from the Fryerson discovery, showed in  $P_2 O_5$  34 per cent. The vein dips easterly 65 degrees, and has a course of south 30 degrees east, at the point where I took it here near the Fryerson discovery. From the discovery I traveled over the claim along the side of the mountain, over to Francis Gulch.

Q. Still on the claim?

A. Still on the claim, yes, sir, but I did not see much float or ore in place until I got over in Francis Gulch.

Q. Francis Gulch?

A. Francis Canyon, I believe it is called. The vein is again found in place on the south side of the canyon. The vein dips very steeply to the east, and is not given in York Gulch.

Q. The dip not given?

A. Dips very steeply there, almost vertically; the vein dips very steeply and slightly easterly.

Q. What is the breadth of the vein there?

A. I judged, from what the exposure there was, it was probably some 40 or 50 feet. There was no place I saw along here where there was an absolutely characteristic true vein from wall to wall.

Q. Were you able to discover the walls on that claim?

A. From traveling easterly and westerly, at about

(Testimony of William A. Wilson.)

the center of the lode, in places I could see the jutting outcrop of the sedimentary beds of which all this country is built up. This examination was made on November 15, 1910. [455]

Q. Now, what were the walls of the Fryerson?

A. The walls of the Fryerson are in both cases the limestone.

Q. There is only one case in the Fryerson, only one claim?

A. Well, in both cases where I made the examination. Here the sedimentary beds of limestone are sometimes on top and more or less silicious.

Q. Did you distinguish, and if so in what manner, the vein from the walls?

A. It could be distinguished by finding no mineralization in one, and the dark phosphorite ores.

Q. How about readily observing or seeing them?

A. For the same reason they were readily distinguished from the vein.

Q. That claim is also in the same Sublette range of mountains as shown on Exhibit "A"?

A. Yes, sir; and some thousand feet or so distant.

Q. How as to finding the vein or lode in place, Mr. Wilson?

A. Why, I considered it, judging from the amount of workings, that the vein was in place.

Q. Have you any doubt about it?

A. No, sir. At the northerly end of the China the ground is much broken up, loose rock. There is a little more work there.

Q. I am talking about the Fryerson lode now.



(Testimony of William A. Wilson.)

A. On the Fryerson I had no doubt on this end, and the other end, where I saw the vein, it was close to the southerly end line of the Fryerson.

Q. You were near the southerly end line, were you?

A. I was near the southerly end line on the Fryerson. [456]

Q. How near?

A. At about—I did not make a note of it—50 or 100 feet, I should judge, where the vein was again seen.

Q. The same vein?

A. The same vein as passed through the Fryerson.

Q. Anything else in respect to any physical characteristics on either the Japan and China or the Fryerson?

A. Nothing except my observations, which I am giving you now. Of course you could extend these notes indefinitely, taking observations every 50 feet. Here we reach the footwall, and here we reach the hanging-wall at this point, and the side lines of the claim here. I did not consider it necessary, the vein was so plainly outlined, and the walls showed so prominently.

Q. You may pass now to Exhibit 1. Your first visit there was in 1909?

A. Was in 1909, July 9th. I went from Montpelier up the canyon, looking over some old workings upon—

Q. Who was with you?

A. I think Mr. Jeffs, but it was just a little trip; we had about half an hour's time, or something like that.

(Testimony of William A. Wilson.)

Q. So it was in 1910, in October—

A. In 1910, October 29th is when I made the extended examination.

Q. Will you please start in at some point and go into detail as to that examination, as to what you found of the characteristics, the formation, and the form in which the deposit of phosphorite was found.

A. I left Montpelier and drove up the canyon, and went up Gertch Hollow in the Preuss Range of Mountains to the northerly end of the Obey claim. The country is much [457] broken, and I did not find any phosphorite until I came to the tunnels marked on the map, 1, 2 and 3. There I found the phosphorite vein, which had at that point a strike of south 10 degrees east, and a dip of 30 degrees to the west. In tunnel No. 3 I took the course of the vein, south 15 degrees east, and dips 15 to 25 degrees westerly. It was so irregular I was not sure whether it was 15 or 25.

Q. (By Mr. BUDGE.) What tunnel was that?

A. That was tunnel No. 3. Proceeding across Gertch Hollow and up on the mountain on the other side, I came to a very strong showing of the vein with the phosphorite ore in numerous cuts and tunnels.

Tunnel No. 4, I took the dip only in this tunnel. It dips 27 degrees westerly; then at the discovery I took sample No. 1, as marked on Exhibit 36 as "Montpelier 1, discovery Obey," which showed 33.6 per cent of  $P_2 O_5$ .

From the discovery I proceeded southerly, examining the vein as shown by a long line of strippings,

(Testimony of William A. Wilson.)

and a tunnel, and also at times ascended or descended, but looked at the rock in the vicinity to try to outline the extent and width of the lode, it not being shown by any cross-cut through it.

Q. With what result?

A. With the result that I found a continuous vein or lode of phosphorite running through this ground.

Q. By this ground, what do you mean, Mr. Wilson?

A. By this ground I mean the Obey and Obed lodes. At the discovery of the Obed lode I took sample No. 2, marked on Exhibit 36 as "Montpelier 2, discovery Obed" from  $51\frac{1}{2}$  feet of phosphorite. [458] The vein at this point has a strike of south 30 degrees east, and a dip of 38 degrees westerly.

Q. (By Mr. BUDGE.) That is tunnel No. —

A. That is from the discovery of the Obed.

Q. Did you say you were unable to find the width of the lode?

A. Not positively. I got the idea it might be anywhere from 25 to 75 feet, from my inspection of the surface.

I continued this manner of investigation of the lodes, and looking at the adjacent country and examining cuts and openings wherever I could, finding phosphorite mineral in almost every case, I think in all cases where they are dug deep enough. I crossed the end line of the Obed lode and came to the Jimtown lode, and at the discovery of the Jimtown I took sample No. 3, a sample taken from  $31\frac{1}{2}$  feet of ore—from alongside of rich ore—could not get to the

(Testimony of William A. Wilson.)

bottom on account of the cave. I could not sample the full width of the phosphorite at the discovery of the Jimtown, on account of the caved condition of the pit.

I then proceeded to examine the country in the same manner of the Fentress lode, and at the Fentress lode took sample No. 4 from 5 feet in thickness of phosphorite, and the vein at this point showed a course south 30 degrees east, and a dip of 20 degrees westerly.

From the Fentress I proceeded to the Cumberland lode, examined the various workings on there as well as the foot and hanging-wall.

Q. A moment. Were you able to trace it so far as you have gone?

A. Trace it by these cuts? No; at times the country would [459] be pretty flat and you would not see the lode or the foot or the hanging-wall; other times it would stand out quite prominently.

From the Cumberland discovery I took sample No. 5, taken from the upper part of the vein. The course of the vein was south 15 degrees west, dipping 30 degrees westerly. Vein in place, but owing to the folding of the rock here the strike was a little different.

From the Cumberland I proceeded along the vein as outlined by the cuts and workings to the Overton lode, and there took a sample from the Overton discovery. I did not give the assay of that Jimtown sample. Do you want that put in?

Q. Yes; put it all in as you go along.

A. The sample on Exhibit 36, marked "Montpelier

(Testimony of William A. Wilson.)

No. 3," is at the discovery of the Jimtown, and contains 32.7 per cent of  $P_2 O_5$ .

"Montpelier No. 4, discovery Fentress" contains 32.9 per cent of  $P_2 O_5$ .

"Montpelier No. 5, discovery Cumberland," contained 32.8 per cent of  $P_2 O_5$ . There were two samples taken from the Cumberland. One was taken in the tunnel shown at the point marked 17 in red on Exhibit 1, from a cross-cut running from a point in that tunnel. It was just to determine the character of the phosphorite; and was about the same. It shows an assay of 29.04 of  $P_2 O_5$  and marked "Montpelier 6-a, Cumberland tunnel."

Then, at the discovery of the Overton I took sample No. 7. [460]

The Overton has numerous workings showing the phosphorite in place and between the walls, as outlined before. One of the workings is very old, and evidently had been sunk on this dark material, but probably not known what it was at the time; there was considerable on the dumps. At the Overton discovery took the strike of the vein as south 15 degrees west, with a dip of 37 degrees westerly.

Q. It changed to the west?

A. It slewed around a little.

Q. Explain all the details.

A. That is owing to the uptilting, the manner of these sedimentary beds being tilted up or uplifted, that the strike may vary as you go along.

Q. I wish you would explain all these things as you go along.



(Testimony of William A. Wilson.)

A. Well, that explains the difference in the strike of the vein owing to the uptilting of the sedimentary beds. Sample No. 7 of the Overton assayed 32.3 per cent of  $P_2 O_5$ .

The next day, October 30th, came to the Mt. Pleasant lode and examined it and the numerous cuts along the surface, and took sample No. 8 at the discovery, and marked "Montpelier 8, discovery Mt. Pleasant," 31.8 per cent  $P_2 O_5$ . The course of the vein here was northerly and southerly, with a dip of 17 degrees westerly.

From the Mt. Pleasant lode claim I proceeded to the Arkansas claim, and again found the vein in place, with the wall rock also showing, and took a sample at the discovery of the Arkansas, which is near the southerly end line of the claim. This sample is "Montpelier 9, discovery Arkansas," 32.6 per cent of  $P_2 O_5$ , and from 5½ feet of rock. [461]

From the Arkansas lode I traveled over the Hickman lode, examining it in the same way for the vein and the walls, and at the discovery of the Hickman lode took sample No. 10 from 2 feet of phosphate rock in a cut which Mr. Sterling and I called No. 25. This sample is marked on Exhibit 36 "Montpelier 10, discovery Hickman," 33.4 per cent of  $P_2 O_5$ .

From the Hickman we traveled over the Maury lode to the Columbia lode and the Wayne lode, and at the end line of the Wayne lode, which was the crest of a ridge, we found good phosphorite—at the end line of the Wayne lode, the northerly end line of the Wayne lode, and proceeded from that end line down

(Testimony of William A. Wilson.)

to the discovery of the Wayne lode and there took sample No. 11, marked on Exhibit 36 "Montpelier No. 11, discovery Wayne," 33.4 per cent  $P_2 O_5$ .

At the Wayne discovery found the strike of the vein to be northerly and southerly, and a westerly dip, but I have not marked down the dip, but I think Mr. Sterling gave it at that point. That completed the examination of the claims shown on Exhibit No. 1.

Q. From your experience as a mining engineer, and your examination of this ground, did you come to any conclusion as to whether or not the vein or lode that you have referred to is continuous throughout the length of the claims platted on Exhibit 1?

A. Yes, sir; I consider that a vein or lode with a northerly and southerly strike, and a westerly dip, within well defined walls in the mass of the mountain.

Q. Is it one and the same vein or lode throughout the strike, or different? [462]

A. One and the same vein and lode. The apparent irregularity being due to the contour of the country.

Q. I was about to ask you to explain the apparent irregularity as it appears upon Exhibit 1, as to the course or strike of the lode.

A. The apparent irregularity is due to the gulches cutting the lode, the steep hillsides, and the irregularity in the uplifting of the sedimentary beds, there may be a roll on the strike, and there may be a roll on the dip, and in each case it would alter it to some extent.

Q. Will you please refere to exhibit number in

(Testimony of William A. Wilson.)

making your explanation?

A. Well, that is what I thought I had been doing. To give it more in detail, why the first surface feature that I mentioned was Gertch Hollow, which proceeds from the main Montpelier Creek in a northwesterly direction, and thus cuts the Obey claim. The next big surface feature is the Montpelier Canyon, cutting down between the Overton and the Mt. Pleasant plane. These are the two main features. There are many subsidiary gulches and gulleys all along the course of the lode; and I would say that the irregularity in regard to the strike and dip of the lode, where it changes from a course of some south 10 degrees east to south 15 degrees west and from dips varying from 15 degrees to 45 degrees, is due to the irregularity of the uplifting of the sedimentary beds. As I say, there may be a roll on either the strike or a roll on the dip, which would be ample to account for that; and [463] in addition to that why the natural irregularities which occur in the surface where the vein or lode outcrops, due more or less to the breaking down at the surface of the apex of the lode.

Q. What opinion did you form from your investigations as to whether or not there was a vein or lode within those claims?

A. As a result of my examination I came to the conclusion that the claims on Exhibit No. 1 contain a vein or lode with a dip and strike well defined, containing dark mineral phosphorite, and all located in the solid mass of the mountain.

Q. What did you find or determine to be the walls

(Testimony of William A. Wilson.)

of the vein? A. The walls of the vein?

Q. Take the hanging-wall first.

A. The hanging-wall of the vein is a limestone, one of the beds. It is a bedded vein, on account of conforming with the dip and strike of the sedimentaries which enclose it.

Q. Conformable to the sedimentaries?

A. To the sedimentaries enclosing it; and the hanging-wall, as I was saying, is this cherty limestone, and sometimes varies in character as limestone will in its course, and the same is true of this.

Q. Were you able by eyesight to distinguish it from the lode?

A. When you go up to it and examine it, this phosphorite is so plain you could readily detect it when you get to a rock outside of the vein that had no phosphorite in it.

Q. Explain how you could tell the difference.

A. By its appearance. [464]

Q. By its appearance?

A. The dark rock. The same is true of the foot-wall, which is limestone, very often not as silicious as the hanging-wall lime, but at times quite silicious, and usually a little lighter color, I would say, than the hanging-wall. The colors will vary with the weathering. With a long tunnel running into the vein or footwall of lime, you could see the blue lime and white lime, and the silicious character of it would show more and give its character more positively than where you see it weathered on the surface.

Q. Are there any other characteristics of a lode or vein that you found here, that you have not stated?



(Testimony of William A. Wilson.)

A. No, sir; outside of the fact of the assaying of the materials in this vein or lode, and found it to contain a valuable mineral,  $P_2 O_5$ .

Q. Explain what is the valuable mineral.

A. The valuable mineral is tri-calcium phosphate, a union of calcium, phosphorus and oxygen.

Q. Of commercial value?

A. Of commercial value, on account of the phosphorus contained therein.

Q. And that vein you found to exist at all places where you were able to see or observe the vein?

A. That was so. My samples were just from the discovery, but the character of the mineral which I have examined all through the lode was of that same character.

Q. Is there more than one lode or vein within walls along these claims?

A. No, sir; I consider it one lode or vein. [465]

Q. Just give your reasons for that.

A. My reason is on examination of the deposit I find that the phosphorite ore is found in alternating layers from the foot to the hanging-wall, and I think along the course they would blend into, and where there is a division of shale and silicious rock, why that in places would be eliminated, and in other places would be enlarged, coming together and filling the vein and cutting out the ore, so I consider it as one lode or vein, with these divisions in different points by layers of shale and silicious lime in the lode.

Q. Have you examined other phosphate deposits within this district or section of the country?

A. I have further to the south.



(Testimony of William A. Wilson.)

Q. How familiar are you with the phosphorite deposits throughout this section of the country, outside of these claims shown on these three exhibits?

A. I am just to confine myself to these three exhibits?

Q. Yes.      A. Well—

Q. I say, have you generally, or have you had occasion to examine other phosphate deposits in this district or section of the country?

A. Yes, sir; including some in Utah.

Cross-examination.

(By Mr. BUDGE.)

Q. How long, Mr. Wilson, were you engaged in the investigation of the claims or phosphate deposits in other places than what are shown on these exhibits?

A. I would approximate it as about fifteen days altogether, different trips made. [466]

Q. At other places?

A. At other places, yes, sir; down in the Crawford range and at Hot Springs.

Q. You were there, you say, during fifteen days?

A. Altogether, I should think, I have put in fifteen days.

Q. On the ground?

A. Well, on the ground and going to and from it.

Q. On the ground and going to and from it?

A. Yes, sir; probably.

Q. How long?      A. Probably ten days.

Q. Ten days. When was that?

A. That was during 1909 and 1910. I went up to the claim with Jeffs, and I went with a Professor

(Testimony of William A. Wilson.)

Koenig of Houghton School of Mines, made trips at different times for the purpose of examining the different claims of Duffield and Jeffs.

Q. And those visits comprising or embracing altogether ten days on the ground, consisted of several trips? A. Yes, sir.

Q. There was no one trip of ten days over there while you were upon the ground ten days?

A. No; I don't think so; probably five or six days.

Q. The longest? A. Yes.

Q. And the others were other trips that made up the ten days?

A. Yes, sir; made up probably a total of ten days of actual examination.

Q. Now, is that the extent of your experience in the examination of phosphate rock, outside of these here shown on Exhibits [467] 1 and "A" and "B"? A. Is that the extent of my examination?

Q. Yes; of phosphate rock.

A. Yes, sir; I have not examined phosphate rock in other portions of the country.

Q. Now, how long were you employed in the examination of the rock or deposit on the ground and in a way covered by these exhibits?

A. A little over a day and a half.

Q. That is for the China and Japan lodes and Fryerson and these other claims named on Exhibit 1? A. On Exhibit 1, yes, sir.

Q. And that is the only time you made any examination, a day and a half?

A. Yes, sir; a day and a half. This other trip which I spoke of, which I made, I estimate I think

(Testimony of William A. Wilson.)

only at half an hour or so.

Q. Now, I understood you to say that the irregularity in the dip and strike of this deposit was due, according to your judgment as a mining engineer, to the uplifts of the sedimentary deposits?

A. Yes, sir; the irregularity in that uplift mainly, with subsidiary causes owing to what water would run through the ground might make a little difference.

Q. Yes; but I am speaking in the general sense.

A. In a general sense that is really the cause of the change.

Q. In other words, it is your idea, is it not, Mr. Wilson, that this series which you denominate is the vein or lode?

A. I did not call it a series, Mr. Budge. I call it a [468] vein or lode.

Q. And then you don't accept the idea—

A. I call it all one.

Q. —that this vein or lode, as it now appears, with the walls of limestone, calcium carbonates and other cherty limestones—

A. Yes, sir.

Q. —was at one time in a horizontal position?

A. Undoubtedly, yes, sir.

Q. And that the irregularity is shown—that is, what I mean by that, the whole vein or lode, as you term it, within these walls, was at one time in a horizontal position, and that its present position and irregularities of strike and dip, as now shown, were due to the irregularity of the uplifting of this deposit? A. Yes, sir.

Q. That is correct? A. Yes, sir.

(Testimony of William A. Wilson.)

Mr. DEY.—We will admit all that, Mr. Budge, so that there will not be any controversy.

Mr. BUDGE.—I know you would, but I want to get a mining engineer to admit it.

Q. Now, Mr. Wilson, you say that the mineral has the usual form of mineral—within this deposit?

A. Yes, sir.

Q. That is what is known, is it not, as a nonmetallic mineral? A. A nonmetallic mineral, yes.

Q. And it is nonmetallic in the same sense, although perhaps not of the same minerals, but it is nonmetallic mineral in the same sense that salt is nonmetallic mineral? A. Salt? Oh, no. [469]

Q. Yes. A. Sodium you know is a metal.

Q. I understand that, but salt is sodium chloride—sodium and chlorine together make salt, does it not?

A. Makes salt.

Q. Now, salt, the combination of these two substances is the same, nonmetallic mineral,—in the sense that this is? A. Oh, no.

Q. It is not? A. No, sir.

Q. It is not in the combined sense?

A. No; sodium is a metal. These divisions into metallic and nonmetallic are, however, rather shaky. One chemist will put arsenic in one class, and another in another class. In the future, or to-morrow, we may have some chemist put phosphorus among the metals in his classification. We do not know when arsenic and antimony will be in one class. It is uncertain about these two.

Q. What I want to know is this: and I am asking you to get your idea of it specifically. I understand

(Testimony of William A. Wilson.)

that sodium is a metal. That is correct?

A. Yes.

Q. And sodium, in the form in which it is found in salt deposits, is not a metal as it there exists, is not a metal in its metallic form?

A. Well, the element is there.

Q. The element is there, but it is in combination with chlorine? A. It is a salt of sodium.

Q. It is not in metallic form, in the ordinary salt bed?

A. Well, we would call it the metal sodium united with chlorine, forming a salt. [470]

Q. You would not say that the sodium that is in that salt is in its metallic form?

A. No more than we would call the gold in the chloride of gold; that the gold in it was in metallic form. It is a chloride, but the gold is there just the same.

Q. If it is in nonmetallic form, the base is there but not in a metal form?

A. It has not got the characteristics and properties of the metal element as you have got it in a pure state, but the metal is there; the gold is there.

Q. Are you familiar with the deposits of gypsum?

A. Well, I have seen them.

Q. And know their chemical contents?

A. Chemical contents, yes; it is sulphate of lime.

Q. Or calcium sulphate, as it is commonly called—

A. Calcium sulphate.

Q. —by the chemist? A. Yes.

Q. Now, that is also a nonmetallic mineral?

A. Calcium sulphate? Oh, no.

Q. Is not calcium a mineral?



(Testimony of William A. Wilson.)

A. No; calcium is a metal.

Q. I mean a metal—it is a metal, but it is not in metallic form in calcium sulphate?

A. It has the calcium there, and it is in this combination; it is a chemical combination.

Q. Now—

A. It is not in its metallic form, because if it was it would be only calcium.

Q. If it is in nonmetallic form you can say so, but I ask you whether calcium sulphate or gypsum, as it is usually called, [471] existing in the combination, is in metallic form?

A. Calcium is there as a metal sure, no matter what the combination may be there—

Q. Can't you answer my question?

A. I am answering it, you know, as I understand it.

Q. I am trying to be perfectly fair with you.

A. So am I with you.

Q. What I want to know—

A. There is no getting away from the element; the element is there all the time, no matter what combination it is, it is there; it must be.

Q. Certainly, referring to calcium phosphate, but the metal is not there?

A. It is calcium phosphate. The metal calcium is in the calcium phosphate just as in calcium sulphate, not with the physical characteristics, but it is there just the same; the element calcium or metal is there.

Q. Of course it is; but in the state that this calcium phosphate is, nonmetallic, as the term is ordinarily used and understood, it is nonmetallic, in the same

(Testimony of William A. Wilson.)

sense that calcium sulphate is nonmetallic?

A. No; it is not, because here referring to calcium phosphate, the phosphoric acid—

Q. I am not asking you anything about phosphoric acid, and I am not asking anything about what used for, I am asking simply about the chemical contents, as to whether both are not nonmetallic in the same sense. [472]

A. No. If you are considering the calcium in a strictly chemical way. As regards phosphorite ore, calcium is a metal and phosphorus is a nonmetal; it is made up of a metallic and a nonmetallic element.

Q. The two combined is a nonmetallic mineral?

A. Oh, no, you could not say that and define it in a strictly technical way. You have to put it that way—

Q. Which way?

A. That it is a combination of the metal calcium and the nonmetallic substance phosphorus.

Q. All right. Then in the same way you would define calcium sulphate to be the metal calcium with the nonmetallic substance sulphur?

A. And arsenic—

Q. That is correct, isn't it?

A. That is a union of the base calcium with the sulphuric acid to make calcium sulphate.

Q. So that we can understand one another—in the same sense that this calcium phosphate is a combination of the metal calcium with the nonmetallic mineral phosphorus? A. Nonmetallic element.

Q. Element phosphorus? A. Yes.

(Testimony of William A. Wilson.)

Q. The calcium sulphate is a combination of the mineral calcium with the nonmineral substance sulphur? A. Yes; and oxygen.

Q. There is oxygen in both of them?

A. Yes, sir.

Q. So that the oxygen does not make a distinction between them, except perhaps in quantity. And that is also true with salt or sodium chloride, as it is termed I think, isn't it? [473]

A. Sodium chloride.

Q. Is a combination of the metallic sodium with the nonmetallic element chlorine?

A. Yes, sir.

Q. Borax is a combination of the metal boron and sodium?

A. I never heard of the metal boron.

Q. Well, what is boron?

A. Boron is a nonmetallic substance.

Q. That is a nonmetallic substance?

A. Yes, sir. The sodium is the metal.

Q. So that in borax then it is the combination of the metal sodium with the nonmetallic substance boron? A. Element.

Q. That is correct too? A. Yes, sir.

Q. Now, calling your attention to veins—this deposit which you say was at one time in a horizontal position and was uplifted to its present form,—according to your idea of it, I will ask you whether or not that is the manner in which the ordinary vein, as you understand it as a mining engineer and as it is understood by mining men, comes into place?

(Testimony of William A. Wilson.)

A. Very often that would be the case.

Q. Is that the usual way in which a vein is formed?

A. It all depends on the character of the vein, but when you go into the question of the classification of veins, according to their form or origin—

Q. Let us confine it then to the gold lodes or veins.

A. Yes.

Q. Not placer deposits, but of a gold vein or lode. Does that come into place by an uplifting of the sedimentary deposit?

A. There are cases in which that is so. [474]

Q. Do you know of any?

A. I think I can mention one.

Q. Where? Let us have it.

A. I think on the Witwaters rand in South Africa.

Q. Have you made a particular study of that?

A. No, sir; I have never been there.

Q. Have you made a study of it by reading about it? A. By reading, yes, sir.

Q. From your reading, isn't that a vein which is cut by what is known as porphyry dikes?

A. Not that I recall.

Q. You don't remember it?

A. There may be some porphyry dikes there. I do not recollect them.

Q. You do not recollect of having read about them. Is there any other vein you know of in your experience?

A. I would like to explain about the Wittwaters rand vein. According to the writers, it is a great

(Testimony of William A. Wilson.)

saucer-shaped deposit of great extent, I do not really know how many miles it is in extent. The Mining and Engineering Journal has told us from time to time about the lode, and the gold mining done there—how they mine and mill. The uniformity of the vein has been commented upon, and how they find it at great depth—two or three or four or five thousand feet, and there find it again in practically the same condition, with the gold in it. Now that vein, the character of it, is a lot of pebbles cemented together with iron pyrites—

Q. I do not care anything about the formation.

A. I want to say—

Q. I am not interested in that. What I want to get at is— [475]

A. Well, I am coming right to the point that the question involves.

Q. Are you going to keep on talking?

A. I want to, until I get through with this question and explain—

Q. That is something I did not ask, and I don't care anything about your explanation.

A. I do; I want it to go in the record in answer to your question.

Q. You are not interested in putting into this record all this stuff?

A. Why, certainly, I want to put in what is necessary to complete my answer.

The NOTARY.—I think in this court the rule is to allow the witness to finish his answer.

Mr. BUDGE.—This is a matter that is a whole



(Testimony of William A. Wilson.)

lot different from what you ordinarily take testimony in.

Mr. DEY.—I think the witness has a right to make his answer, and that he is answering it, and I desire him to do so.

Mr. BUDGE.—My understanding is that it is not a question as to what you desire, and I would like this to go into the record, but that the witness, of his own volition, is going on with a long explanation on something which has nothing to do with the question.

Mr. DEY.—All right, you asked the question, and I think he was answering your question, which meant clearly whether he knew of any other—anything in reference to a gold [476] deposit, and he is going on to explain it, and I think he is entitled to.

Mr. BUDGE.—I did not ask him to give the explanation, but simply an instance of where there was such a deposit.

Q. Now, do you know of any other deposit?

A. I would like to have that original question read, Mr. Budge, to see whether I was answering it, and I will try to answer your question.

(Notary reading:) Q. Not a placer deposit, but a gold vein or lode. Does that come into place by an uplifting of the sedimentary deposit? A. There are cases in which that is so.

Q. Do you know of any? A. I think I can mention one. Q. Where? Let us have it. A. I think on the Wittwaters rand in South Africa.

Q. Have you made a particular study of that?

A. No, sir; I have never been there. Q. Have

(Testimony of William A. Wilson.)

you made a study of it by reading about it? A.

By reading, yes, sir. Q. From your reading, isn't that a vein which is cut by what is known

as porphyry dikes? A. Not that I recall. Q.

You don't remember it? A. There may be some porphyry dikes there—I do not recollect

them. Q. You do not recollect of having read about them? Is there any other vein you know of in your experience?

A. It is the uplifting I was asked about there, and I was coming to that.

Q. Do you know of any other instance where a vein or lode of gold is formed by uplifting, and without any long [477] descriptions. To make myself clear, I want some instances and where located.

A. Do you know yourself the meaning of your question?

Q. I don't care about the question. Are there any other instances?

A. There is no answer to that question, because there is no vein formed by uplifting. The veins are formed and uplifted afterwards.

Q. Do you know of any other instances? If so give them to us.

A. Where the vein is formed and has subsequently been tilted up?

Q. I said, do you know of any other instances where a gold vein or lode has been at one time in a horizontal position—that is, with the mineral substance there, and afterwards tilted up?

(Testimony of William A. Wilson.)

A. Why, I suppose there are hundreds of them, Mr. Budge.

Q. Do you know of any?

A. I just see them as they are at the present day with our present eyes. We cannot tell when that gold was placed in there. We find gold along the bedding-planes of sedimentary rock. I might know of hundreds, as we see them to-day, but I cannot recognize them. I can't tell whether they are or are not from their appearance to-day.

Q. Now, Mr. Wilson, so as to avoid any further confusion, I just want to say if you will please listen to my question and then answer it and then stop, and if you have any explanation, you may make it afterwards.

A. I will try to answer your questions direct. I will answer them in the light I understand them.

Q. Do you know how the Wittwaters rand deposits are located or [478] taken up?

A. Why, I suppose by the English law.

Q. Answer the question—do you know?

A. No, of course not.

Q. You don't know then whether as a lode or placer? A. I don't believe I have got any—

Q. Well, you don't know?

A. I don't know of my own knowledge. They are taken up in thousand foot squares, as I recollect it; that is my recollection of it, but I do not know.

Q. Within certain defined boundaries?

A. Defined, common law rights, going vertically down within the lines.

(Testimony of William A. Wilson.)

Mr. DEY.—The same as in Canada.

Q. They are within vertical lines?

A. Yes, sir.

Q. They do not follow extralateral rights on the dip as they do here? A. No; they do not.

Mr. BUDGE.—I did not know whether that was the case or not.

Q. Now, from your examination of this deposit, you discover, do you not, Mr. Wilson, that there were several alternating beds of this calcium phosphate?

A. I discovered what I call a banded structure; it would be a good, high grade phosphate rock, and then might be a layer of shale, and look like it had considerable phosphorus in, and there might be a hard lower lime and another layer of phosphate, and in that way had a kind of a banded structure, as you would see it in the section of the vein. [479]

Q. Was not the limestone wall in between a well defined wall of limestone?

A. I could not call it wall at all. I expect if I should drift on what you call the wall I would go 50 feet and come to the point—

Q. Did you see any evidences of a point?

A. There is no such amount of work that you could tell that.

Q. Did you ever see one of those limestone beds pinch out?

A. Why, I saw it in a general way, because when we took some of the samples on the strike of the ore I saw 5 feet, and other places 3 feet. There must be a diminution in the thickness of the phosphorite

(Testimony of William A. Wilson.)

rock in different places.

Q. Did you see any evidences of pinching out of the limestone rock, or any place where it did pinch out?     A. In the manner I have described.

Q. Did you see any place where it had pinched out, where you come to the end of the limestone strata?

A. Why, I think I must have, because I came to that conclusion.

Q. Did you, do you know?

A. Positively, because I came to that conclusion.

Q. Do you remember any?

A. I can't put my finger on the spot.

Q. Do you remember ever having seen it?

A. I can't put my finger on any spot.

Q. Can you answer the question? Do you remember now of any such?

A. I remember it in the way I have stated.

Q. You haven't in mind any particular point?

A. No, sir; no particular point. [480]

Q. On any of these deposits where you saw that condition?

A. No; I can't say that, but that is the conclusion of engineers who have examined mines and veins, that you see them pinch out and increase in size.

Q. Now, you spoke about this China lode. What do you consider to be a fissure?

A. A fissure is a rupture of the rocks of the earth, in a general way.

Q. Any fissure on these deposits?

A. Yes, sir; I mentioned one that was right in the face of that—



(Testimony of William A. Wilson.)

Q. That is what I want to call your attention to.

A. The China lode.

Q. (By Mr. DEY.) The Fryerson?

A. No; it was the Japan lode, right in the face, there is a fissure running out easterly here—

Q. I mean of this deposit, in which this deposit is located.

A. Why, I saw evidence of slickenside movement, you know, but I would not know whether that was a fissure, from what evidences I saw, or whether due to the uplifting that I saw of the strata.

Q. And it is reasonable to suppose, according to your idea, that it was due to the uplifting?

A. It could be explained that way.

Q. It is a reasonable explanation?

A. It is a reasonable explanation.

Q. Now, then, did you see anything—any of these deposits concerning which we are interested in, did you see any fissure other than what you have indicated there? [481]

A. I suppose I must have because these gulches and things are lines of fissures, you know.

Q. I am not asking you for what you suppose, or what must be so. I ask you what you did see. Do you know what you saw? A. At what point?

Q. Any point.

A. I have not connected a point where I—

Q. In there, I said.

A. In there? I certainly saw the rocks fissured in a number of places along there.

Q. Will you answer my question?

(Testimony of William A. Wilson.)

A. You ask me where I see any fissures. I am telling you right along in the hanging-wall and footwall there are fissures in innumerable places, sometimes only called joints and cleavage planes, in other places would be strict fissures.

Q. Is it your interpretation of a fissure—so that I can get your idea of a fissure—as a mining engineer, do you contend that the space between what you call the hanging and foot wall is a fissure?

A. No, sir.

Q. It is not a fissure, as you state?

A. No; not in this bedded vein.

Q. It is not a fissure in the sense you use that term?

A. No. There may be open spaces along these beds that allowed the accumulation of phosphorite. It is a bedded vein conforming to the strata.

Q. So that the walls between which this substance is found is not a fissure in the sense in which it is used among mining men and mining engineers?

A. No. A fissure vein is only the filling of a fissure. [482] Now, owing to the uplifting there might have been such a thing as the beds parting along the bedding-planes, a rupturing of the beds, and the vein at that point will make a swell and be thicker.

Redirect Examination.

(By Mr. DEY.)

Q. Will you please explain with respect to depositions of mineral and physical conditions in that

(Testimony of William A. Wilson.)

South African place that you were asked about, the Witwaters rand.

A. The mineral or ore seemed to enclose or surround pebbles that were cemented together with pyrite of iron, iron pyrites, which had the valuable constituent—the gold. This has been mined extensively and at great depth. The physical form of the deposit is a great saucer-shaped basin, and the conclusion is that it was more or less sedimentary when it was formed, with the gold in it; and by uptilting it has been given its present form.

Q. Locally in this country, are there any sedimentary deposits containing gold, silver or other metals?

A. Why, recent writings in regard to the occurrence of lead in Illinois, Wisconsin and Missouri. A theory has been advocated (I think Professor Janney) that the lead occurring in that country was deposited at the time the lime was laid down.

Q. Are you familiar with the Silver Reef in Utah?

A. Yes.

Q. What are the conditions there?

A. The Silver Reef is an occurrence of silicious sedimentary rocks, one layer of which has become impregnated with valuable ore and has been mined for such. [483]

Q. Located as a lode?

A. Located as a lode, as I understand it.

Q. Referring to the chemical combinations about which you were cross-examined, take tin, lead, zinc and iron. Do any of those appear except in chem-

(Testimony of William A. Wilson.)

ical combination?

A. Do any of them appear?

Q. Yes.

A. Gold and lead in a native state are found at times.

Q. I say do they occur except in chemical combination?

A. Yes; when they are native they occur; but the greater occurrence is in a combined state.

Q. Does iron occur in a native state?

A. Very seldom; in meteors it sometimes occurs.

Q. From meteors?

A. But that is about the only occurrence I know of.

Cross-examination.

(By Mr. BUDGE.)

Q. Don't you remember, Mr. Wilson, from your study of that South Africa gold deposit which you have named, that the deposit contains porphyry dikes, and that the theory of the geologists is that the gold which is found in that deposit was taken in there in solution through these dikes by percolation, from those dikes?

A. That is not my remembrance, but that would be no reason geologists should come in conflict—

Q. Don't you remember that that is the accepted idea of geologists on it? A. No, sir.

Q. Now, this salt, borax and gypsum all are taken up under the [484] placer law?

A. Well, I don't know as to borax, because we have got veins of borax.

(Testimony of William A. Wilson.)

Q. What is your understanding about it?

A. Why, I think if it is a vein it would be a lode.

Q. Well, how about salt?

A. Salt? Why, I think the Government has passed such laws as tell you how to take it up; otherwise if it had been a vein like this phosphate rock, why I would have said to take it up as a lode.

Q. Do you know how salt deposits are taken up?

A. I believe the Government has outlined how they are to be taken up. I think as placers.

Q. As placers. And isn't that true also of limestone?

A. Limestone? I believe limestone comes under the limestone and sandstone quarry act.

Q. But they are sedimentary deposits?

A. They are sedimentary rocks.

Q. And auriferous cement also?

A. Why, in California where there is a level place I believe it is taken up under the placer law.

Q. I am calling attention to the cement deposits up here. I think what they call Weber Canyon.

A. Oh, there is one up here in Parley's Canyon.

Q. They are taken up as placer?

A. They will be taken up under that act. There are sedimentary beds around there containing the proper constituents to make cement. [485]

Q. They are taken up as placers?

A. That is the way the Government says to take them up.

Q. That is true also of fire-clay?

A. As to fire-clay, I think it is true, but as each



(Testimony of William A. Wilson.)

case comes up, why the Government specifies under what act it shall be taken up. Of course, no placer rock is in place.

Q. Are you familiar with the borax deposits down in California, near to a place known as Daggett?

A. No, but I have seen them at Sodaville, Nevada, and down at the Lilly mine, where borax is in a fissure, down near Greenwater.

Q. Have you seen the gypsum deposits down here near Nephi?

A. No, but I have further down at Cedar City.

Q. They are all placer?

A. I think that is the Government instructions, to locate them as placers.

Q. You don't know of any gypsum in this country that is taken up in any other way, do you?

A. No.

Q. Or salt either, or any of these others I have named? A. No, sir; I don't know of any.

Mr. BUDGE.—That is all.

(Signed) W. A. WILSON.

Mr. DEY.—It is stipulated that I can take these Exhibits 1, "A" and "B," with me to Pocatello, for the hearing at that place, and bring them back and return them to the notary who has taken the testimony in these cases.

Mr. BUDGE.—Yes; we will agree to that. We would like to have them there ourselves.

\* \* \* \* \*

**Stipulation [Concerning Performance of Discovery Work, etc., on Certain Claims].**

Mr. BUDGE.—It is hereby stipulated and agreed that on or about the 8th day of July, 1904, as to the Winfield, Winter, Wonder and Winslow placer mining claims; and that on or about the 22d day of August, 1904, as to the Wilmington placer mining claim; and that on or about the 11th day of June, 1904, as to the Colcock and Inman placer mining claims; and that on or about the 3d day of December, 1905, as to the Wizard placer mining claim (all of which said claims are particularly described in the cross-bill herein); the predecessors in interest of the defendant, the San Francisco Chemical Company, performed all the acts required by law in respect to making a discovery upon said claims [492] respectively, and in performing the requisite discovery work, and in duly marking the boundaries of said placer mining claims, and each of them, and in posting the notices of location.

Also, that the location notices so posted were in due form, and that copies thereof in due form were duly recorded.

Also, that the requisite work of at least \$100.00 a year has been performed for the benefit of each of said placer mining claims, during each calendar year since the location of said claims respectively, and that proofs in due form have been made of said work, and that said proofs have been duly recorded.

It is also stipulated and agreed that on or about the 15th and 16th days of November, 1907, the complainants, Morse S. Duffield and Lewis A. Jeffs, in

reference to the Obey, Obed, Jimtown, Fentress, Cumberland, Overton, Mount Pleasant, Arkansas, Hickman, Columbia and Wayne lode mining claims, described in the bill of complaint herein, performed all the acts required by law in respect to making a discovery upon said claims respectively, and in performing the requisite discovery work, and in duly marking the boundaries of said lode mining claims and each of them, and in posting the notices of location.

Also, that the location notices so posted [493] were in due form, and that copies thereof in due form were duly recorded.

Also, that the requisite work of at least \$100.00 a year has been performed for the benefit of each of said lode mining claims during each calendar year since the location of said claims respectively, and that proofs in due form have been made of said work, and that said proofs have been duly recorded.

Provided, however, that this stipulation is not intended to in any manner destroy the effect, if any, of any evidence now in the record, or which may hereafter be taken on behalf of the defendant, as to the circumstances under which said lode locations were made and said assessment work for the benefit of said lode mining claims was performed; it being the intention to stipulate only as to the performance by each party of the physical acts required by the laws of the United States and of the State of Idaho and the State of Wyoming in the location of placer and lode claims respectively, and in the performance of assessment work, and the making of proof thereof.

Also, the record title being in the respective parties as alleged in the pleadings herein. [494]

**[Testimony of Randolph H. Groo, for Defendant.]**

RANDOLPH H. GROO, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. How old are you, Mr. Groo?

A. I am 35 years old.

Q. Where do you reside?

A. Montpelier, Idaho.

Q. How long have you resided there?

A. About 30 years, more or less.

Q. What is your occupation?

A. I am a quartz miner.

Q. How long have you been engaged in the business of mining?      A. About 17 or 18 years.

Q. And where?

A. In Utah, Idaho, Montana, Colorado, and British Columbia.

Q. On what kind of properties have you worked?

A. I always worked on what is termed quartz mines.

Q. Quartz mines?      A. Yes, sir.

Q. That is, lode claims, you mean?

A. Yes, lode or quartz—lode—vein.

Q. Have you ever worked on placer?

A. No, sir, never, but of recent years I—on this.

Q. Well, I mean other than the work you are en-

(Testimony of Randolph H. Groo.)

gaged in now, have you ever been engaged in work on placer claims? [495] A. No, sir.

Q. Now, in whose employ are you at this time?

A. The San Francisco Chemical Company.

Q. How long have you been working for the company? A. Five years.

Q. That is the defendant in this case?

A. Yes, sir.

Q. And where have you been working for the company?

A. Most of the time at Montpelier. I worked some in Wyoming, and Utah.

Q. Wyoming and Utah? A. Yes, sir.

Q. Calling your attention, Mr. Groo, to what is marked as "Exhibit 1, J. W. C.," which is Complainant's Exhibit 1, are you familiar with these placer claims known as the Colcock, Winfield, Inman, Wonder, Winter, Winslow and Wizard?

A. Yes, sir.

Q. And with what is known as the Waterloo placer? A. Yes, sir.

Q. And also with what is known as the Wilmington placer? A. Yes, sir.

Q. Where is the Wilmington from the Colcock—in which direction? A. It lays east.

Q. Straight east? A. Yes, sir.

Q. Now, during the time since 1905, is it upon these properties that you have worked?

A. Yes, sir, at Montpelier. [496]

Q. At Montpelier? A. Yes, sir.

Q. Are you also familiar with the lode claims



(Testimony of Randolph H. Groo.)

known as the Obey, Obed, Jimtown, Fentress, Cumberland, Overton, Mount Pleasant, Arkansas, Hickman, Maury, Tennessee, Columbia and Wayne?

A. Yes, sir; I know where they are.

Q. Are you familiar with their boundary lines and corner stakes, as the same are marked on the ground? A. Yes, sir.

Q. Now, you may explain, Mr. Groo, what particular mineral body or mineral deposit occurs within the boundary lines of these placers which I have named.

A. Why, there is a bed of lime phosphate existing in these placers; that is, the outcrop of it.

Q. And does that appear or is it exposed upon each of these placers? A. Yes, sir.

Q. Just describe the bed—how it occurs on the ground.

A. I don't just understand what you mean.

Q. Just tell us how it appears—what it looks like there on the ground—on these various claims.

A. Why, it makes just the same as a limestone ledge does most generally, only it is a different color; it makes right in the series of rock. Wherever this particular rock happens to be exposed you find the phosphate along with it.

Q. What rock is that you are talking of?

A. This limestone rock—limestone ledges.

Q. Now, just describe how this calcium phosphate deposit [497] occurs, with reference to the rocks that surround it.

A. It makes right with it, whichever—

(Testimony of Randolph H. Groo.)

Q. What is on either side of it?

A. It follows the rocks.

Q. What is on either side of it—above it and below it? A. Limestone.

Q. Limestone?

A. Immediately below it and above it. In some places there isn't anything over the bed except loose wash.

Q. Now, are you familiar with the Waterloo mine?

A. Yes, sir.

Q. So called? A. Yes, sir.

Q. And I will ask you if upon that claim there is any place where the phosphate appeared at the surface without any overlying rock?

A. Yes, sir.

Q. And where, with reference to the tunnel of the Waterloo mine?

A. Will you just point that tunnel out, please? Well, it is just above the main tunnel.

Q. In which direction—West, or East, or what?

A. East.

Q. East? A. Yes, sir.

Q. And do you know what has been mined, or approximately what quantity has been mined there from that particular place, from the surface?

A. There has been about 5,000 tons. [498]

Q. Are there any other places within the placer claims; that is, within the Wizard, or the Winslow,—

A. I beg your pardon. I would like to state here that I was asked whether or not there was any overburden whatever on this. There was some—that it

(Testimony of Randolph H. Groo.)

was stripped right off—

Q. Well, what was it?

A. In places there was limestone, and in places there was nothing but dirt—wash.

Q. Yes. And what other places within the boundary lines of any of these placers which I have named (either the Wizard, the Winslow, the Winter, the Wonder, the Inman, the Winfield, the Colcock, or Wilmington), what other place—place or places within the boundary lines of these placers, do you find the phosphate rock without any overlying bed of limestone?

A. Near the North end of the Wizard.

Q. And to what extent—what area, approximately,—is there in that condition?

A. On the Wizard, I should judge there was—judging from the amount taken off of the Waterloo claim—I should judge there was at least 10,000 tons on the Wizard that could be easily stripped and quarried in an open quarry.

Q. Any other place besides the North end of the Wizard?

A. On the Winslow there is fully that much.

Q. Whereabouts on the Winslow—what part of it? A. It would be in the northeast corner.

Q. Any other place, on any of the other claims?

A. There could be considerable ground stripped on the Wilmington. That wasn't asked, though.

Q. Yes, I asked about the Wilmington. [499]

A. Oh, yes.

Q. Now, as to these places concerning which you

(Testimony of Randolph H. Groo.)

have testified, where the phosphate rock could be mined in an open quarry, would it be possible to mine it in any other fashion, or any other method?

A. No, sir; it would be utterly impossible to mine it underground.

Q. That is, by underground workings?

A. Yes, sir.

Q. Now, from your experience as a practical miner, would you call this deposit of calcium phosphate a lode or vein? A. No, sir.

Q. In what respects does it differ from a lode or vein?

A. In all lodes that I ever worked in—and I worked in—that is all I ever did do work in, that kind of mines—they had a distinct wall on either side, as a rule of different material within the ore of itself; it was a different character of material—a different character of rock.

Q. Now, is this bed that is being mined of different rock, or is it the same character of rock on either side of it?

A. Well, it is a little different; but of course, I am not a geologist; but from what they have told me—

Mr. DEY.—Never mind that.

Mr. BUDGE.—Yes; never mind that.

Q. Calling your attention to this underlying bed of phosphate, is the rock above it a phosphate rock also? A. Yes, sir.

Q. The rock below it is phosphate?

A. Just straight limestone. [500]

(Testimony of Randolph H. Groo.)

Q. Now, what other distinguishing characteristic do you have in mind which distinguishes this from a lode, as you understand a lode, from your experience?

A. Lodes often—I have worked in a great many of them—often occur with a dip just opposite to the formation; just whatever the regular dip of the formation is, a lode or vein will dip just the opposite direction. This runs identically with it.

Q. With what?

A. With the formation around it; it has the same dip. The main reason I don't think it is a lode is because it has no gangue matter.

Q. What do you mean by "gangue matter"?

A. I mean gangue is stuff that ores makes with—quartz. That is what I call gangue. This phosphate, the full bed is mined, all of it; there is no sorting.

Q. And in the mining of it, is there any extraction of this phosphate?

(No answer.)

Q. Is there any sorting in this?—

A. No, sir.

Q. In this phosphate mining? A. No, sir.

Q. And does it contain any "gangue," as you call it? A. No, sir.

Q. Do you know of any lode in your experience but what did contain gangue? A. No, sir.

Q. Now, how does the gangue differ—so it may be more [501] clearly explained—how does the gangue differ from the rock—the country rock on



(Testimony of Randolph H. Groo.)

either side in a lode?

A. Well, it is usually of different material, but it is perfectly worthless. It comes in different forms; sometimes it is a soft talcky substance that ore makes in; sometimes it is a hard quartz-like substance that the material makes in.

Q. The refuse that is in the deposit?

A. Yes, sir.

Q. And that is within the walls? A. Yes, sir.

Q. Now, what have you to say concerning the apex of a lode, and what is claimed as the apex of these lode claims on this phosphate deposit? Do they differ, or are they the same? A. They differ.

Q. In what respect?

A. Why, the apex to this phosphate bed is wherever the erosion happens to make it. If there happens to be a swail, or a hollow, it would form an apex. If there happens to be a sag in the ground, and the erosion has been great enough, it forms another apex, with the dip extending on up the mountain.

Q. In other words, from the point that is within the boundaries of these lode claims looking up the hill above the boundary line of the lode claims, there is a deposit of phosphate? A. Yes, sir.

Q. And where does that occur? In what places have you mined where that occurs?

A. You have reference to the lode claims?

Q. Yes. A. On the Arkansas— [502]

Q. I meant where is it that the phosphate deposit occurs outside of the boundary lines of the lode

(Testimony of Randolph H. Groo.)

claims and farther up the hill?

A. There is one place on the Wilmington It occurs on the Winslow, above the Mount Pleasant lode claim.

Q. Above the Mount Pleasant lode claim?

A. Yes, sir.

Q. And where else, if you know?

A. On the Wizard, above the Arkansas, I think.

Q. Does it occur above the Hickman lode?

A. Yes, sir.

Q. And does the deposit extend easterly?

A. Yes, sir.

Q. Outside of the boundary lines of the Hickman lode? A. Yes, sir.

Q. Another bed, is it, or another bed than that found on the Hickman?

A. Why, it is the same bed.

Q. Calling your attention to the manner in which these lode locations appear, are they located with reference to the strike as lode claims are located?

A. No, sir.

Q. In what respect do they differ?

A. Well, a lode location is made along the strike, of course on the dip; but a lode is supposed to have, according to my understanding, a regular dip, either one direction or another.

Q. Has this a regular dip?

A. Yes, sir, it has. Yes, it has a regular dip, certainly. [503]

Q. Well, are the claims—the lode claims—located with reference to the dip, as lode claims are located?

(Testimony of Randolph H. Groo.)

A. No, sir.

Q. Well, where do they differ? In what respect?

A. Well, these lode locations are made—if they would follow the dip they would run into each other. One goes around on the dip—

Q. If they follow the dip, you mean, or if they follow the strike?

A. If you follow the strike—if you follow the outcrop, where the phosphate outcrops?

Q. Yes.

A. If you follow that around, your claims run right into each other. You have got one claim running to the—would be dipping into the northwest; you have got another claim dipping into the southwest—which would be contrary to locating a lode.

Q. Well, calling your attention particularly to the Mount Pleasant; how is that claim located with reference to this particular deposit?

A. Well, if you commence working on the Mount Pleasant on what would be termed the apex in a lode, the dip would be up out of the ground, instead of being a dip down into the earth.

Q. I will ask you, is the Arkansas lode claim higher up or lower down than the Mount Pleasant?

A. It is higher up.

Q. It is higher up? A. Yes, sir.

Q. Now, is there an outcrop of phosphate on the Arkansas lode? [504] A. Oh, yes.

Q. Now, in which direction does that bed of phosphate which the outcrop of it is on the Arkansas lode, dip? In which direction does it dip?

(Testimony of Randolph H. Groo.)

A. It dips to the West

Q. It dips to the West? A. Yes, sir.

Q. And where is the next exposed from the Arkansas? A. Upon the Mount Pleasant.

Q. And where is the Mount Pleasant with reference to the creek—Montpelier Creek?

A. It lays just East of it.

Q. And what part of the bed which dips from the Arkansas into the Mount Pleasant is exposed on the Mount Pleasant?

A. I beg your pardon. Will you read that question?

(The last question was repeated.)

A. It would be the lower edge of it.

Q. The lower edge of it? A. The westerly edge.

Q. From the outcrop which occurs on the Mount Pleasant, is there any deposit of phosphate which dips down into the earth? A. Not that I know of.

Q. Well, have you been over the ground?

A. Yes, sir.

Q. And the only deposit which is found on the Mount Pleasant, or which outcrops on the Mount Pleasant, extends in which direction—the bed, I mean,—up the hill, or down the hill? [505]

A. It extends up the hill.

Q. Is there any portion of this deposit, Mr. Groo, which you now have stripped ready for open quarry work? A. Yes, sir.

Q. Where is it?

A. It is located on the Waterloo.

Q. Is there any other near that, that is mineable

(Testimony of Randolph H. Groo.)

only by open quarry, in addition to this that is stripped off?

A. Yes, sir; there is a great deal. We are preparing now to—that is, we are running a raise from below it, cutting up from under the heavy overburden up to where the overburden is light, preparing a place there that we will take out, judging from what we have taken out, I should imagine about 20,000 tons.

Q. And that also will be taken out as an open quarry? A. Yes, sir.

Q. And can it be mined in any other way?

A. No, sir.

Q. Now, how do you mine this phosphate rock, Mr. Groo?

A. We mine it by drilling it, or by drilling it with this coal auger, under steel—picking it, blasting it with giant powder.

Q. And by means of shafts and tunnels, or inclines, or what? A. By a tunnel.

Q. A tunnel?

A. We have never mined it any other way. [506]

Cross-examination.

(By Judge DEY.)

Mr. Groo, how long have you been familiar with the ground shown on Exhibit 1? A. Five years.

Q. Have you examined this exhibit, so that you are familiar with it?

(No answer.)

Q. If not, I wish you would.

Mr. BUDGE.—Just step over here, Mr. Groo.



(Testimony of Randolph H. Groo.)

(The witness did so, and examined said exhibit.)

A. I think that is all the examination I need of that.

Q. In a general way, describe the topography.

A. The which?

Q. The topography.

A. I don't understand what you mean.

Q. The lay of the ground.

A. The lay of the bed, or the lay of the claims?

Q. The lay of the country?

A. Why, this bed of phosphate runs along the face of the mountain, dipping to the west. It is a—

Q. No— Well, what I was getting at is, Mr. Groo, first, the lay of the country shown on Exhibit 1. Are there any gulches? A. Oh, yes.

Q. It is a mountain range, is it? A. Yes, sir.  
[507]

Q. And what gulches—whereabouts is there a gulch?

A. There is a gulch—the main canyon gulch cuts right through the limestone which underlies the bed of phosphate. It also cuts through the upper limestone.

Q. I take it, then, it is a deep gulch?

A. The Montpelier Canyon, yes, sir.

Q. The Montpelier Canyon, you call it?

A. Yes, sir.

Q. And broad? A. Not very—just medium.

Q. What lode claims on Exhibit 1 are represented at this Montpelier Canyon, on either side of it?

A. The Mount Pleasant, the Overton, the Cumber-

(Testimony of Randolph H. Groo.)

land, the Tennessee,—

Q. This is the Tennessee away over here. (Indicating upon Exhibit 1.) Do you mean that?

A. I was following on other land there.

Q. Well, you can come up nearer, Mr. Groo, so that you can correct it, if you want to. Now, you have mentioned the Mount Pleasant, and the Overton, and the Cumberland.

A. It is near the Montpelier Canyon.

Q. Is it down in the gulch?

A. No; it is up on the hill.

Q. That is what I am asking you—down in the gulch—across the gulch—any of them? In other words, just explain here on Exhibit 1 what you were attempting to describe about the Mount Pleasant lode.

A. Explain about the—

Q. You were speaking about a dip up hill. Explain that [508] in connection with Exhibit 1 and in connection with the gulch or canyon.

A. The Arkansas here is located upon what is supposed to be the apex, dipping down off on the Mount Pleasant.

Q. What is this here? (Indicating upon Exhibit 1.) A. The creek. This lays on the sidehill.

Q. The Arkansas you mean now?

A. The Arkansas lays on the sidehill, dipping to the West. It runs—the bed lays on the face of the mountain, the same mountain dipping down to the west. The Montpelier Creek—canyon—cuts the bed out down to the Mount Pleasant, which leaves

(Testimony of Randolph H. Groo.)

the exposures dipping—still dipping to the west; but it is cut off there; it has gone out of the canyon.

Q. By the erosion?

A. By the erosion, yes, sir.

Q. Exactly.

A. Consequently, the dip of the Mount Pleasant would be up the hill. The Arkansas is here, the exposure is up here, and the exposure down there. The Mount Pleasant is located right down here. (Indicating upon Exhibit 1.)

Q. Below? A. Below the Arkansas.

Q. Where the erosion has cut the bed of phosphate? A. Yes, sir.

Q. Exactly. And that is due to the conditions that exist at this Montpelier Canyon, that the bed has been cut—washed out by erosion?

A. Yes, sir.

Q. Starting in on Exhibit 1 at the Obey lode, it is covered, [509] I take it, by the Colcock placer. Where do you find this deposit of phosphate outside of the boundaries of the Obey lode—if at all?

A. The Obey is all on the Colcock, is it?

Q. Well, come here and see, so that you will be sure.

Mr. BUDGE.—Step right over here.

(The witness did so.)

A. This is the Obey here? (Indicating.)

Q. This is the Obey. (Indicating.) The Obey comes up to here. I am calling attention to that in reference to the Colcock first. Is there any deposit— A. Why, it lays— Yes, sir.

(Testimony of Randolph H. Groo.)

Q. Whereabouts on Exhibit 1?

A. Well, sir, I can't tell you from that.

Q. Well, if you can't tell from that, is it an extension from the Obey to the North on the Colcock placer?

A. I don't know whether there is any exposure there or not, above the Obey on the Colcock.

Q. If it exists at any place, it would be to the North of the Obey lode, would it not?

A. I don't know as to that.

Q. Then, as I understand you, you can't state that at any place on the Colcock placer, outside of the portion included within the Obey lode as shown on Exhibit 1, there is no phosphate deposit found?

(No answer.)

Mr. BUDGE.—Speak up, Mr. Groo, if you can. We don't want to consume too much time.

A. Well, I was trying to call to mind the ground without [510] the map, as it lays. I don't know of any exposure.

Q. Passing now to the Obed and Jimtown lodes. Is there any of this deposit of phosphate ore within the exterior boundaries of the Inman, Winfield or Colcock placers, outside of the exterior boundaries of the Obey, Obed and Jimtown lodes?

A. I don't know of any.

Q. And is that true of the portion of the Fentress that lies within the exterior boundaries of the Winfield placer?

A. I don't know of any exposure; no.

Q. Passing now to the Winter placer; is there any

(Testimony of Randolph H. Groo.)

phosphate deposit of ore found within the exterior boundaries of the Winter placer outside of the boundaries of the Fentress, Jimtown and Cumberland lodes? A. I don't know of any.

Q. Is there—the same question, let me ask you, Mr. Groo, in reference to the Wonder placer, and the Cumberland and Overton lodes?

A. I don't know of any.

Q. Passing next to the Winslow placer; is there any of this deposit of phosphate ore found within the exterior boundaries of the Winslow placer outside of the exterior boundaries of the Overton lode and Mount Pleasant lode? A. Yes, sir.

Q. Whereabouts, showing by Exhibit 1?

A. This is North, isn't it? (Indicating.)

Q. Yes.

A. There is a patch right here. (Indicating.)

Q. In what direction would that be? [511]

A. That would be the North—

Q. —East— A. —East—

Q. —end?— A. —end,—

Q. —of the Mount Pleasant lode?

A. —of the Mount Pleasant lode.

Q. And North— In other words, northeast of the northeast end of the Mount Pleasant lode, and near the northeast corner of the Winslow placer?

A. Yes, sir.

Q. Now, taking the Arkansas lode and the Wizard placer; taking the Arkansas and the Hickman lodes and the Wizard placer; is there any of this deposit of phosphate ore within the exterior boundaries of



(Testimony of Randolph H. Groo.)

the Wizard placer outside of the exterior boundaries of the Arkansas and Hickman lodes? A. Yes, sir.

Q. Whereabouts—East, or what?

A. East of the Arkansas, and East of the Hickman.

Q. Now, then, I take it,—I just want to ask Mr. Groo one question—I take it that this is the East boundary line of the Wizard placer? (Indicating upon Exhibit 1.) A. Yes, sir.

Q. Now, the witness wants to understand the map. Answer the question.

A. There is on the Hickman, but not that I know of on the Arkansas.

Q. Now whereabouts, by Exhibit 1, in reference to the Hickman lode? [512]

A. Well, it would be along the East side line of the Hickman lode.

Q. Are you sure of that? A. Yes, sir.

Q. To what extent is it traceable?

A. Not to a very great extent.

Q. I wish you would mark it, if you please, in some way, about where it is.

A. It would be along somewhere in here, I think. (Indicating upon Exhibit 1.)

Q. It would be by the figure 99.16, east of the Hickman lode?

A. I imagine somewhere in there.

Q. Passing now to the Wayne lode and the Wizard placer; is there any portion of this deposit of phosphate ore within the exterior boundaries of the Wayne placer and outside of the general boundaries

(Testimony of Randolph H. Groo.)

of the Wayne lode?

Mr. JACK.—Of the Wizard placer, you mean?

Judge DEY.—Of the Wizard placer; yes.

A. I don't know of any.

Q. So that so far as these placer claims are involved, in this case,—you are familiar with the names of them, are you?      A. The placers?

Q. Yes.      A. Yes, sir.

Q. Namely, the Wilmington, the Colcock, the Winfield, the Inman, the Winter, the Wonder, the Winslow, and the Wizard; the [513] entire deposit of phosphate ore within the boundaries of those placer claims I have mentioned is found within the exterior boundaries of the several lode claims, except only in the instance of the Hickman lode claim which you have just described. Is that the fact?

A. No, sir—the Hickman and the Mount Pleasant.

Mr. BUDGE.—He said there was some off of the Mount Pleasant.

Judge DEY.—Oh, yes.

Q. With the exception of the Hickman and the Mount Pleasant, which you have just described?

A. Yes, sir I believe that is—

Q. —right?      A. —right.

Q. Describe, if you please, in your own way, the dip of this phosphate deposit.

A. It dips to the west.

Q. A regular dip to the west?      A. Yes, sir.

Q. Do you know about how many degrees dip it is?

A. Why, I have measured it in a great many places. It varies a little; some places 20°, some places 30°.

(Testimony of Randolph H. Groo.)

Q. And in all cases conformable to the stratification—or dip of the country rock? A. Yes, sir.

Q. Has it a strike? A. Yes, sir.

Q. Do you know what the strike is, or course?  
[514] A. North and south.

Q. Northerly and southerly? A. Yes, sir.

Q. Course and strike? A. Yes, sir.

Q. Is the dip into the mountain?

A. Not on all the claims.

Q. Well, all except the Mount Pleasant, that you have just referred to? A. No, sir.

Q. Except at the canyon, where the erosion has occurred, is the dip into the mountain?

A. No, sir.

Q. Well, just tell us how it is.

A. It dips right along with the—the quarries below the Waterloo claim. It is a flat country and the dip is right with the mountain, until it comes down to where it is flat, and I suppose it goes on underneath it.

Q. You can trace it from the north end as shown on Exhibit “A”—the Obed lode—down through to the Wayne, can’t you? A. Yes, sir.

Q. Exposed in many places—the outcrop?

A. Yes, sir.

Q. And at all these outcrops, at certain places stripping has been done, has it not?

A. Well, I suppose you would term it stripping. It has been uncovered in a great many different places.

Q. Now, do you find one or more stratas of this phosphate ore? [515]

(Testimony of Randolph H. Groo.)

A. We find more than one.

Q. Within what boundaries?

A. Why, you find it exposed in any of these placer claims mentioned—in the boundaries of these placer claims.

Q. Oh, yes; but I mean within what boundaries enclosing this deposit?

A. Well, I don't know just how wide these series are.

Q. They haven't been cross-cut at any place?

A. Oh, yes.

Q. Eh?

A. We have a cross-cut there through them for at least 120 feet at the mine—the Waterloo mine.

Q. That is the Waterloo mine?      A. Yes, sir.

Q. Any other place?

A. Yes; there are a number of other places. On the Winter—on the Wonder there is a cross-cut.

Q. Now, what is your idea or opinion as to what constitutes a vein?

A. Well, a vein, in my ideas, would be a body of metallic rock—ore—making between defined walls, walls of a different character to the stuff itself, having a regular strike, and having a dip.

Q. Now, we have in this case a definite strike and a dip, do we not?      A. Yes, sir.

Q. You have stated that this ore was distinguishable by the color of the rock in which it is found?  
[516]      A. I didn't say that.

Q. Didn't you? —that you could tell it by the different color from the walls or boundaries?

(Testimony of Randolph H. Groo.)

Didn't you say that? A. I say it now.

Q. Yes; I think you said it. And just describe the difference in color by which it is distinguishable.

A. The phosphate rock itself is of darker color than the walls within which it makes. Each layer of the phosphate is that way.

Q. A darker color? Could you state what the color is?

A. Well, it varies. It is black and broken—

Q. But it is darker than the walls?

A. —and white and gray.

Q. Now, the walls you have stated are limestone, I believe? A. Yes, sir.

Q. Cherty limestone?

A. There is no cherty limestone immediately over the commercial bed of this rock.

Q. Well, now, to understand you, is there more than one stratum or layer of the phosphate rock that is of commercial value, within the series you have mentioned? A. I don't know of any.

Q. Just the one? A. Yes, sir.

Q. Now, then, when you were referring to the walls of limestone, were you referring to the immediate boundaries of this one commercial stratum, or to the series of strata that [517] contain the phosphate ore? A. To this one commercial stratum.

Q. To the one? A. One commercial bed.

Q. To the one? A. Yes, sir.

Q. Now, what is the immediate overlying or hanging-wall of that?

A. Well, it is a highly fossilized limestone.

Q. And what is the lower wall, or footwall?



(Testimony of Randolph H. Groo.)

A. A limestone.

Q. Eh? A. It is a limestone.

Q. Of what thickness is this underlying stratum of limestone?

A. I don't know. I never went through it.

Q. Then, it is very thick? A. Evidently.

Q. And how in respect to the hanging-wall of highly fossilized limestone?

A. You mean the roof rock over the bed?

Q. Yes—how thick is that?

A. Well, it varies; in places it is about three feet, and other places there isn't any limestone over it.

Q. Where you have referred to places where there was no limestone overhanging, have you reference to certain places where erosion has broken it away?

A. Yes, sir. [518]

Q. Now, will you designate those spots or places on Exhibit 1? Just make a letter "E," we will say.

(The witness marked said exhibit.)

A. I don't claim that all these will be that way.

Judge DEY.—No—I will have you explain that when you have made your "E" marks.

(The witness continued marking the exhibit.)

Q. How many "E's" did you mark?—two?

A. Two.

Q. I notice that you have placed an "E" at the northeast, beyond—just beyond—the northeast end line of the Mount Pleasant claim, and within the Winslow placer? A. Yes, sir.

Q. Just describe in your own way the conditions there.

A. That lays on a tolerably level surface, upon a

(Testimony of Randolph H. Groo.)

kind of a flat on a hill, on the Mount Pleasant; and the places that I have marked on the Hickman is a steeper sidehill, dipping to the west.

Q. Now, Mr. Groo, maybe I can ask a question or two to make it plainer to us: What do you find there at these two places you have marked Exhibit "E"—or which you have marked with the letter "E," I should say?

A. What character of stuff?

Q. No. What did you find—yes, what did you find there? Of what does it consist in general? How is it found?

A. Why, there is rocks and wash and limestone.

Q. What has produced or caused that condition?

A. I am not a geologist. I couldn't tell. [519]

Q. Oh, no, I don't mean anything geological at all; I mean the simple condition as you find it, as a miner, how did it come there? Where did it come from? Was it in place in the mountain?

A. The phosphate is in place, as near as any of the other—

Q. Well, but this wash that you are speaking of—does that contain phosphate rock?

A. Nothing other than just float.

Q. All just float, you call it?

A. That is, the dirt that you first get on top of the surface; you go under that and you find the phosphate rock, that is as near in place as any of the rest of it.

Q. Yes—just the same as any of the rest of it?  
(No answer.)

(Testimony of Randolph H. Groo.)

Q. And both of these places that contain the wash and float that you have marked with the letter "E" are outside of the lode claims? A. Yes, sir.

Q. And does the deposit continue through the ground that you have designated by the letter "E"? Does the deposit of phosphate rock continue through that on its course or strike?

A. Yes, sir, it does to where, it is cut off by the Montpelier Canyon.

Q. Well, at the places—at the two places you have marked with the letter "E" on Exhibit 1?

A. Yes, sir.

Q. So that is it not the fact that, excepting for the [520] float found as you have described, that all of the deposit of phosphate rock or ore is found upon these lode and placer claims in the form and manner with dip and strike as you have described them?

A. Lode and placer claims?

Q. Within the exterior boundaries of the lode and placer claims? A. Yes, sir.

Q. Now, you are familiar, of course, with the discovery point or places of the several lode claims—of the several placer claims—are you not?

A. Yes, sir.

Q. Can you point out on Exhibit 1 the discovery place on the Wilmington claim?

A. Well, the Wilmington—

Q. Mr. Hamer, just change the Wilmington to the Colcock placer.

A. Why, it would be somewhere near the south-east part of the claim—the discovery.

Q. Would it be within the boundaries of the Obey

(Testimony of Randolph H. Groo.)

lode? A. Yes, sir.

Q. And upon the course or strike of this deposit of phosphate ore? A. Yes, sir.

Q. Passing now to the Winfield placer; where is the discovery of the Winfield placer?

A. I think that is about in the center of near to the west side line, about in the center of the claim.

[521]

Q. Within the exterior limits of the Jintown or Obed lodes? A. Yes, sir.

Q. And upon the course or strike of this deposit of phosphate rock which you have described, running through this property? A. Yes, sir.

Q. Passing now to the Inman placer; where is the discovery of that?

A. It would be to the northeast corner somewhere.

Q. Within the limits of the Obed lode?

A. Yes, sir.

Q. And upon the course and strike of this deposit?

A. Yes, sir.

Mr. BUDGE.—It is agreed that the discoveries on each of the placer mining claims of the defendant were made within the exterior boundary lines of the lode claims of the complainants, except as to the Wilmington placer, upon which there are no lode claims.

Judge DEY.—Yes—that makes that plain.

Q. Just a question or two: At the two places on the Exhibit 1 you have marked with the letter “E,” are there any workings?

A. Our workings, or whose workings? —anybody's?

(Testimony of Randolph H. Groo.)

Q. Yes. A. At these two places?

Q. Yes. A. Yes, sir. [522]

Q. Both of them?

A. I don't think there is any, however,— I don't think there is any much work done on the Hickman where I marked it; there is a great deal of work at the—

Q. —at the northeast end of the Mount Pleasant?

A. —the Mount Pleasant.

Q. Eh? A. Yes, sir.

Q. A tunnel, or what? A. No, sir.

Q. What is it? A. Pits.

Q. Pits? A. Yes, sir.

Q. Sunk on the deposit?

A. Driven along on the bedrock, cutting the—it was—where the deposit was exposed there is a great number of pits driven along right with the strike.

Q. At right angles—no—right with it?

A. Right with the strike. At other places there is pits driven at right angles with the dip—square across it.

Q. And ore has been mined and extracted there?

A. There has been ore taken out of these pits; there has been nothing shipped.

#### Redirect Examination.

(By Mr. BUDGE.)

Q. Now, Mr. Groo, calling your attention to the places at which the phosphate is exposed outside of the boundary lines [523] of the lode claims, do you say that there are no other places except what you have marked "E" where the outcrop goes be-



(Testimony of Randolph H. Groo.)

yond the lode boundaries?

A. I remember one other place now; it would be on the north end line of the Arkansas lode.

Judge DEY.—Please mark it as “E2.”

(The witness did so.)

Q. Are there any other places?

A. I don't remember any more just now.

Q. Well, are you certain that there are no other places? A. No, sir.

Q. Now, calling your attention to this Exhibit 1, and to the Obey lode, I will ask you whether or not the deposit runs out of the Obey lode over into the Wilmington? A. Yes, sir.

Q. And across from the east boundary line of the Obey lode crosses the Colcock placer over on to the Wilmington? A. Yes, sir.

Q. And there may be other places, or are there any other places?

A. There may be—I wouldn't say for sure—not that I remember distinctly now.

Q. Now, calling your attention to this bed of phosphate rock (and by that I mean the commercially valuable bed), that is the lower bed, isn't it?

A. Yes, sir.

Q. Now, underneath that is what kind of stone?

A. Limestone. [524]

Q. Now, immediately above that particular layer bed or commercial bed, what is the overlying bed?

A. That is a highly fossilized limestone, containing some phosphate, so geologists have told me.

Q. Well—

(Testimony of Randolph H. Groo.)

Judge DEY.—I move to strike out what he has been told.

Mr. BUDGE.—Yes; I don't care anything about that.

Q. That fossilized limestone that you have referred to as being immediately above the lower bed of the phosphate rock, that is not the limestone that we commonly call the cap lime of the series?

A. No, sir.

Q. Well, how thick is this fossilized limestone?

A. It varies a little bit—from three feet to nothing.

Q. Now, were you working on these claims, Mr. Groo, in 1908 and 1909, and 1910?      A. Yes, sir.

Q. Did you have a conversation with Mr. Wilcox, an employee of Duffield and Jeffs?      A. Yes, sir.

Q. When was that?

A. It was on October 27th, 1908.

Q. Where?

A. In Montpelier Canyon, on the Winter placer claim.

Q. Who was present?

A. Mr. Wilcox—and he had three men with him.

Q. Do you know who they were? [525]

A. I know two of their names, I think. I think one of them was Ennis; another one was his nephew; another, Wilcox.

Q. And who were with you?

A. Well, if I can remember correctly there were four men with me.

Q. And what was the conversation that you had? Just tell us what you said and what he said in reply.

(Testimony of Randolph H. Groo.)

A. When they attempted to camp, or stopped to camp, I told them—forbid them doing any work on the ground; and he went then and held a little consultation with his men, and went off by himself like, or by themselves, and then he came back, and he asked me if they didn't leave the ground what we proposed to do, and I told him that we proposed to put him off physically, if he didn't go.

Q. Well, what did he say?

A. He said, by God he wasn't being paid any fighting wages, and that he would leave.

Q. And did he leave?

A. Yes, sir; he left; he went right down the canyon ahead of us; we followed him down, and he left his camp there—his camp outfit—down on what was then Joe Bagley's ranch.

Q. You say that was in October, 1908?

A. Yes, sir.

Q. When did the workmen for Duffield and Jeffs next come on the claim?

A. On November 30th, 1908.

Q. And under whose charge were they at that time?

A. I think Mr. Colbath was the foreman. [526]

Q. How long did they stay there, Mr. Groo?

A. Well, they didn't leave until the middle of March—from the 30th of November until the middle of March.

Q. Do you know the exact date in March?

A. It was the 19th when they completed, I think.

Q. Now, was any work done on the lode claims by

(Testimony of Randolph H. Groo.)

or on behalf of Duffield and Jeffs at any time during the year 1909, after the 19th day of March?

A. No, sir; none that I know of.

Q. Well, were you there? A. Yes, sir.

Q. On the ground all the time? A. Yes, sir.

Q. And none was done, you say?

A. No, sir.

Q. Now, did you have a conversation with Charles Hoff, the foreman for Duffield and Jeffs, during the year 1910? A. Yes, sir.

Q. What time of the year?

A. It was on April 13th.

Q. 1910? A. 1910.

Q. Where?

A. That would be on our—on the Winslow placer.

Q. And what was the conversation you had with Mr. Hoff?

A. I notified Hoff that he was trespassing, and forbid him doing any work at all.

Q. What did he say?

A. He said all right; he would notify his people, he [527] termed them, and do as they said.

Q. And had he pitched his tent then, or established a camp?

A. They were just commencing to build a tent.

Q. Did he leave the premises?

A. He left the premises, yes.

Q. When did he come back?

A. On the 18th of April, 1910.

(Testimony of Randolph H. Groo.)

Recross-examination.

(By Mr. JACK.)

Q. When was that first conversation with Mr. Hoff, did you say?

Mr. BUDGE.—There was only the one with Mr. Hoff.

Q. When was that conversation? On what date was that? A. On the 13th of April, 1910.

Q. And he left the premises after your conversation on the 13th of April, 1910? A. Yes, sir.

Q. Did all the men that were with him leave the premises at the same time? A. Yes, sir.

Q. There was no one on the ground between the 13th of April, 1910, and the 18th of April, 1910?

A. Not that I ever saw.

Q. Were you up there each day between?

A. I was on our property, yes. [528]

Q. Didn't they have their camp pitched up there?

A. They had it started—they had started to pitch camp.

Q. And did they remove the tents? A. No, sir.

Q. Just left it there? A. Yes, sir.

Q. Did you say anything to them when they went back on the 18th of April, 1910? A. No, sir.

Q. In 1908 you had a conversation with Wilcox and the men upon the ground? A. Yes, sir.

Q. And informed them that they were trespassing?

A. Yes, sir.

Q. Did you ever know of any suit—injunction suit—that was brought by Duffield and Jeffs against the owners of the placer claims, asking an order of



(Testimony of Randolph H. Groo.)

the court that they be permitted to do their assessment work? A. No, sir.

Q. Do you know whether or not such a suit was brought? A. No, sir.

Q. After they returned in November, 1908, to do their assessment work, you gave them no further orders about keeping off, or trespassing?

A. No, sir. I had been instructed between the time—October 27th and November 30th—to permit them to go ahead and do their work without any—

Q. Well, from whom did you receive those instructions? [529] A. Our manager.

Q. Was that Mr. Taylor? A. Yes, sir.

Mr. JACK.—That's all.

Mr. BUDGE.—I will say, Judge Dey, that I may desire to recall this witness again for a few questions; but that is all at this time. [530]

[**Testimony of Richard A. Sullivan, for Defendant.**]

RICHARD A. SULLIVAN, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. What is your name?

A. R. A. Sullivan—Richard A. Sullivan.

Q. And where do you reside?

A. Montpelier, Idaho.

Q. What is your occupation?

A. Cashier of the First National Bank, Montpelier, Idaho.

(Testimony of Richard A. Sullivan.)

Q. How long have you been cashier, Mr. Sullivan?

A. About three years, recently.

Q. Do you hold any office or employment with the San Francisco Chemical Company, the defendant?

A. Yes, sir.

Q. What? A. State Managing Agent.

Q. The designated statutory agent?

A. Yes, sir.

Q. And how long have you been such agent of the company?

A. Why, four or five years—four years, I think, probably.

Q. Prior to the time that you became Cashier of the First National Bank, in what work were you engaged, Mr. Sullivan?

A. I had charge of the clerical end of the office and looked after the assessment work.

Q. Of what? For whom? [531]

A. For the San Francisco Chemical Company.

Q. On what claims?

A. On all their claims—those of Montpelier Creek, and in Wyoming and elsewhere—Utah and elsewhere.

Q. The Montpelier claims to which you have referred are those that are shown on this Exhibit 1?

A. Yes, sir.

Q. Now, I will ask you whether, in the fall of 1907, you were engaged in this work you have just described, for the company? A. I was.

Q. Are you acquainted with the complainant, Mr. Duffield? A. I know the gentleman by sight.

(Testimony of Richard A. Sullivan.)

Q. And with Mr. Jeffs? A. By sight, also.

Q. Did you have any conversation with these gentlemen, or either of them, during the fall of 1907?

A. No.

Q. Did you, in the fore part of January 1908?

A. Yes.

Q. Where?

A. On the Winslow placer claim, in Montpelier Canyon.

Q. And who was present at that time, Mr. Sullivan? A. Mr. Duffield and Mr. Jeffs.

Q. Was anyone with you?

A. My wife was with me, but in the cutter, some distance away on the road.

Q. I see. Just state what the conversation was that you [532] had with the complainants at that time.

A. On the afternoon of the 3d of January, 1908, Mr. Duffield, Mr. Jeffs, Mr. Colbath and one other young man came in on the afternoon train to Montpelier, and I understood that they had stated they were going to do their assessment work on those claims. It being my duty to ascertain whether or not they intended doing so, or were going to do so, and I particularly watched their movements. On the morning of the 6th of January, 1908, they, in a wagon, started up from Montpelier toward the claims, and when they got to the head of Main Street in Montpelier they turned south. I presumed that they had gone out to the lake—out to the Hot Springs, possibly. However, as a matter of pre-

(Testimony of Richard A. Sullivan.)

caution, in the afternoon I, with my wife, went up on the claims, and in going up we saw nothing. I went up for the purpose of ascertaining whether or not they were on our claims. Coming back, as I was passing an opening in the timber on the creek, I noticed a tent, and I stopped and got out and went over there, and Mr. Jeffs was outside of the tent. I didn't know him personally at the time, as to who he was and what he was doing there, and he told me that he was Mr. Jeffs, and that he was there in the cause of their placer claims—of their lode claims. During the conversation Mr. Duffield came out of the tent. However, he done very little of the talking; Mr. Jeffs done most of it; and I informed them both that they were trespassers; that they were on the San Francisco Chemical Company's ground—placer ground—and ordered them off. Mr. Jeffs expostulated, saying that they had a perfect right to remain there, as they had lode locations over our placer locations, and under the law, he contended that they were entitled to do so. [533] I told them that I didn't wish to have any trouble, personally or otherwise, but that they would have to move off the ground; otherwise we would be compelled to force them off. And with that I went away.

Q. Now, did you have any conversation with either of these gentlemen prior to that time, personally?

A. I had with Mr. Duffield on the 6th of December, 1907—that is, a very short conversation.

Q. Where was that, Mr. Sullivan?

A. It was in front of the San Francisco Chemical

(Testimony of Richard A. Sullivan.)

Company's office, in Montpelier.

Q. And who was present?

A. Mr. Ferrier, Mr. Taylor and myself.

Q. You may detail that conversation.

A. Mr. Taylor and myself had gone up the canyon in the morning to make some measurements and to look after some work, and when we got up on the Wonder claim, just across the line from the Winslow, on the west side of the creek—on the north side of the creek—Mr. Taylor had gone in the tunnel and I was standing outside and happened to glance across the creek south, or southeast, and I observed—I saw in a narrow gulch which was obscured from the road, two men working. When Mr. Taylor came out I called his attention to it, and we went over there. There were two men digging a pit, and whose names I afterwards ascertained to be Mr. Colbath and Mr. Sampson, I believe. I asked them what they were doing there, and they said, "Oh, prospecting." I said, "For what—for gold?" and they said, "Well, most anything." I said to them, "Gentlemen, I wish to inform you that this ground has been located, and belongs to [534] us—the San Francisco Chemical Company—the parties whom I am representing, and you are trespassers, and we don't want any trouble with you, but we want you to discontinue working here and get off the ground." They said, "Well, we are not seeking any trouble." I asked them if they were working for themselves, or in the employ of some other parties. They informed me that they were working for Mr. Duffield and Mr. Jeffs.



(Testimony of Richard A. Sullivan.)

Q. Did they leave?

A. They left immediately, yes, sir.

Q. And did you have any conversation with Mr. Duffield on that day, after that incident?

A. After these gentlemen had left this work, I drove down town with Mr. Taylor, and as we got in front of the San Francisco Chemical Company's office Mr. Duffield drove up, and he asked me if I was the sheriff. I told him no. That was all the conversation. No—he asked me if I would tell him where the Sheriff was—where he could find him—and I told him that I thought he was in town that morning—Mr. Frank Wright was the Sheriff at the time—and by that time Mr. Ferrier came out, and that was all the conversation I had with Mr. Duffield at that time.

Q. What conversation occurred between Mr. Ferrier and Mr. Duffield, if any?

A. Mr. Ferrier informed Mr. Duffield that we had informed him he was up on our ground, trespassing, and forbid him going back, or going on the ground as a trespasser.

Q. What did Mr. Duffield say in reply?

A. Mr. Duffield said that he had taken the opposite side of the question; he contended that the ground was lode, and had [535] so located it, and he felt that he had a right to go on the ground, which Mr. Ferrier denied, and simply—the conversation simply went off in their saying—Mr. Duffield said that it was a matter for the courts to decide, and the courts would have to decide the matter later, or words to that effect.

(Testimony of Richard A. Sullivan.)

Q. Was anything said in that conversation about the matter having been decided in the Waterloo placer contest?

A. I think not at that conversation. That is, it might have been—I rather believe it was—but during my conversation with Mr. Duffield and Mr. Jeffs which I have referred to, on the 6th of January, the matter was brought up; I brought the matter up as antecedent as to the condition of the ground, that we owned the Waterloo claim and had received a patent from the Government as placer, and it was at the instance of Mr. Jones, the former locator, having relinquished his titles and withdrawn from the case, or under an agreement to that effect.

Q. What did Mr. Duffield say in reply to your statement that the Waterloo patent should settle the matter?

A. He simply said that it wasn't a matter. I stated, however, in connection with that that it was a matter for the United States Land Office to dispose of; and Mr. Duffield, and Mr. Jeffs especially, stated that they didn't consider it so; that it was a matter for the courts to decide.

Q. Who was Ferrier?

A. Ferrier was the manager of the San Francisco Chemical Company at that time.

Q. Did you have any other conversations with either of these parties at any other time?

A. I don't remember any other conversation.

(Testimony of Richard A. Sullivan.)

Cross-examination.

(By Mr. JACK.)

Q. The conversation in which you spoke about the Waterloo patent having been issued, was the one held December, 1907?

A. No; it was on January 6th, 1908?

Q. 1908? A. Yes, sir.

Q. You informed Mr. Duffield that he was trespassing upon your ground? A. Yes, sir.

Q. Ground that belonged to the San Francisco Chemical Company? A. Yes, sir.

Q. Did they own the ground at that time?

A. They did by right of location and having complied with the statute and doing the assessment.

Q. Did the San Francisco Chemical Company make the placer locations?

A. I don't think so, no.

Q. Do you know who did make them?

A. I don't remember the names, no, not in detail.

Q. Do you remember any of them?

A. I do, yes, sir.

Q. Who are some of the locators?

A. I was one of the locators myself, on a few of them. Mr. Taylor, I believe, was one of the locators.

Q. Mr. Goodfellow?

A. Mr. Goodfellow, and Mr. Eells also, I think.

[537]

Q. Eight parties joining in the location, was there? A. Yes, sir, that is my recollection.

Q. And when you told Mr. Duffield that he was trespassing upon your premises, you said that it was the San Francisco Chemical Company that owned

(Testimony of Richard A. Sullivan.)

these premises that he was trespassing upon?

A. I wouldn't say as to the exact wording as to that. It was ground that I was representing here.

Q. And you were representing the San Francisco Chemical Company?

A. And the locators of the claims as well.

Q. Well, which were you representing?

A. Both.

Q. Well, which one owned it? A. Both.

Q. Both owned it? A. Yes, sir.

Q. How do you make that out?

A. I was representing the parties who had made the locations, through the San Francisco Chemical Company.

Q. You mean that these parties located the claims for the San Francisco Chemical Company?

A. No, sir.

Q. Well, what interest did the San Francisco Chemical Company have in these placer locations on the 3d of January, 1908, at the time of this conversation?

A. I wouldn't say as to whether or not the claims had been transferred to them at that time, though I think they were. However, they had charge of the ground, in behalf of [538] the owners? If it had not been deeded to them already, or transferred, I wouldn't say positively, because I don't remember the dates.

Q. The San Francisco Chemical Company had charge of the ground on behalf of these eight individual locators? A. Yes, sir.

Q. By what kind of an arrangement?

(Testimony of Richard A. Sullivan.)

A. I couldn't say as to that.

Q. You were one of the locators?

A. I was one of the locators, yes, sir.

Q. What kind of an arrangement did you have with the San Francisco Chemical Company to represent you in regard to these claims?

A. I had deeded them my interest in the claims.

Q. Had you at that date?

A. I couldn't say positively as to that particular date.

Q. You had an agreement that you would deed it to them? A. No, sir, not until the deed was made.

Q. Well, do you say that you had an arrangement with them to represent you in regard to this claim?

A. With the other locators, yes, sir.

Q. And you are unable to say what the arrangement with the San Francisco Chemical Company was in regard to representing the locators of those claims?

A. Nothing more than in a general way they were financing the proposition, largely.

Q. Were they not financing it entirely?

A. I couldn't say positively as to that. [539]

Q. Did you have anything to pay in regard to the expenses connected with these locations?

Mr. BUDGE.—We object to this as immaterial.

A. I did not, sir.

Q. When you made the location with seven other parties, did you make it for or on behalf of the San Francisco Chemical Company?

A. No, sir; we made it for ourselves.

Q. And did you afterwards sell the claims to the



(Testimony of Richard A. Sullivan.)

San Francisco Chemical Company?

A. They were transerred to the San Francisco Chemical Company, yes.

Q. Was it a sale? A. Yes, sir.

Q. And did any consideration pass between the locators and the San Francisco Chemical Company for this transfer of title? A. Yes, sir.

Q. What was the consideration?

Mr. BUDGE.—We object to this as immaterial. Answer the question, Mr. Sullivan, if you know.

A. It was a money consideration, to some extent.

Q. To what extent?

A. Well, to the extent that I was—as far as I was personally concerned, by employ by the company.

Q. Your employment by the company was the consideration for your— [540]

A. A part of the consideration, yes, sir; that is, that covered the consideration, practically.

Q. Do you mean that in consideration of the transfer of your interest in these placer locations to the San Francisco Chemical Company, that company agreed to employ you at some compensation?

A. No, sir; I was employed before that—before I had made any locations.

Q. And then on account of your being an employee of the San Francisco Chemical Company, you transferred title to them? A. Yes, sir.

Q. And that was the only consideration?

A. Yes, sir.

Q. And so far as you know, was that the consideration for the other seven locators?

A. I couldn't say.

(Testimony of Richard A. Sullivan.)

Q. You don't know anything in regard to that?

A. I don't know anything about that.

Q. Have you had charge of the accounts of the San Francisco Chemical Company? A. Yes, sir.

Q. Did you ever pay any of the other locators besides yourself any consideration for or on behalf of the San Francisco Chemical Company for this transfer?

A. I had nothing to do with the claims whatever.

Q. You never made any yourself? A. No, sir.

Q. Now, when you informed Mr. Duffield, at that first [541] conversation that he was trespassing, did you tell him who owned that ground, or on whose behalf you were making that warning?

A. I said, unquestionably, "We own the ground"—having reference to the locators and the San Francisco Chemical Company as well.

Q. Whoever the title stood in? A. Yes, sir.

Q. Do you know of any suit being brought subsequent to that, to secure an injunction against the San Francisco Chemical Company, or these eight individual locators, preventing them from interfering with Duffield and Jeffs in doing their assessment work?

A. I remember seeing no legal documents to that effect.

Q. Do you remember any such suit having been brought?

A. I heard that such a suit had been contemplated.

Q. And isn't it true that by subsequent agreement between the parties in interest, Duffield and Jeffs were permitted to continue their assessment work?

(Testimony of Richard A. Sullivan.)

A. I so understood it, yes, sir.

Q. That was in January, 1908, that you so informed him, you say?

A. That I so informed them?

Q. Yes. A. Yes, sir.

Q. At that first conversation you say you had some conversation in regard to the placer—no—at the second conversation, was it,— [542] A. Yes.

Q. —you had some talk in regard to the placers and the lodes? A. Yes, sir, the second.

Q. The second conversation? A. Yes, sir.

Q. Were you at that time—and by “you” I mean you as one of the locators of the placer claims—or the San Francisco Chemical Company, protesting the patent of the Bradley lode location?

A. I didn’t quite catch the question. Just read that question.

(The last question was repeated.)

A. I was one of the protestants on the Bradley patent, at the start, but I don’t remember the date; I couldn’t say whether it was at that time.

Q. Didn’t you inform Mr. Duffield in that conversation in January, 1908, that you were so protesting?

A. I don’t remember having so said.

Q. And didn’t Mr. Duffield tell you at that time that that was conclusive evidence that the question of lode or placer had not been settled?

A. I don’t remember the conversation as to that particular. I know that he contended that it had not been settled, but I wouldn’t say as to that particular matter.

Q. Didn’t you tell him that you were glad he was

(Testimony of Richard A. Sullivan.)

making it a lode contention against a placer, instead of trying to secure the ground as a placer? [543]

A. I did not; no, sir.

Q. In the conversation December 6th, 1907, do you say that Mr. Ferrier informed them that they were trespassing upon the premises? A. Yes, sir.

Q. Did he tell them whose premises?

A. I couldn't say as to that. I was at some distance. I didn't hear all the conversation. I went on in the office before they got through talking.

Q. Did you hear him say they were trespassing upon the premises? A. Yes, sir.

Q. Did he say whose premises?

A. I don't remember.

Q. For whom was he acting when he said they were trespassing upon the premises?

A. He was acting as Manager of the San Francisco Chemical Company, and also representing the locators of the placer claims.

Q. The locators, then, had two representatives on the ground?

A. He was the Manager—the head representative there.

Q. For whom?

A. For the locators and the San Francisco Chemical Company, as before stated.

Q. Were the locators employing him, or the San Francisco Chemical Company?

A. I couldn't say as to that, sir. [544]

Q. Well, is it not a fact that at the time of those placer locations, that each of the eight parties joining in the locations was an employee of the San Fran-

(Testimony of Richard A. Sullivan.)

cisco Chemical Company? A. I don't know.

Q. Do you know whether any of them were?

A. Some of them, I think, were; yes, sir.

Q. Which one?

A. Mr. Taylor was one, I believe.

Q. Mr. Eells? A. I couldn't say.

Q. Mr. Goodfellow?

A. They were San Francisco parties, and I have no means of knowing.

Q. Hadn't they ever been on the ground—Mr. Eells and Mr. Goodfellow?

A. Not during my time.

Q. You say that you told Mr. Duffield that you—you as individuals, or the San Francisco Chemical Company—had secured the rights of Mr. Charles C. Jones? A. How is that?

Q. Did you tell—just repeat that.

(The last question was repeated.)

A. I don't remember saying it in that particular way. I simply said that on the Waterloo contest, because that Mr. Jones had backed down and relinquished any claims which he might have had to the ground.

Q. What kind of a claim, if any, did Mr. Jones have?

A. He had put lode locations over each of the placer locations. [545]

Q. The same as Duffield and Jeffs have?

A. I believe so, yes, of a similar nature; in fact, the lines correspond exactly.

Q. And you purchased a relinquishment or trans-



(Testimony of Richard A. Sullivan.)

fer of the title to those lode locations from Mr. Jones?

A. I don't understand the question.

(The last question was repeated.)

A. I don't know of any purchase. Mr. Jones quit, and relinquished any title which he had—without purchase, as far as I know.

Q. You mean they paid him nothing for the transfer of his title?

A. So far as I know they never.

Q. But he did give a transfer of his lode claims to you and the other locators of the placer claims?

A. He simply relinquished his rights, whatever he had. He abandoned his rights, in other words, and permitted the locators to go ahead and patent this ground, without protest.

Q. Did he relinquish that right to you as individual locators, or to the San Francisco Chemical Company? A. I don't remember as to that.

Q. Do you remember what ground was covered by these lode locations to which Mr. Jones relinquished his right? Was it the same ground that is now covered by the lode claims of Duffield and Jeffs, which are in dispute in this case?

A. Practically so, I think—absolutely so, in fact.

Q. Well, after your conversation with Mr. Duffield and Mr. Jeffs in December, 1907, and January, 1908, Mr. Duffield and Mr. Jeffs did go ahead and perform their assessment work? [546]

A. Later in the fall, yes.

Q. After your talk with Mr. Duffield and Mr. Jeffs

(Testimony of Richard A. Sullivan.)

on January 6th, 1908, did they cease work upon the claims?

A. Yes, sir; there was no work to my knowledge until later in the fall—till that fall—later that fall.

Q. Did you know that they didn't go ahead and do any work? Were you out there each day thereafter?

A. Very nearly so.

Q. Did they leave the ground on the day that you had this conversation with them—January 6th, 1908?

A. I believe that they came down town that evening; if not, the following day. I wouldn't be positive as to that; but it was at that time.

Q. You were out to the claims nearly every day, you say, after this January 6th conversation?

A. Quite regularly; I wouldn't say every day—very nearly so—quite regularly.

Q. For what purpose did you go out?

A. To look after the property and see that there were no trespassers, and we were doing assessment work, I believe, shortly after that date, if I remember correctly.

Q. Did Mr. Ferrier go out?

A. Mr. Ferrier went out quite frequently; I wouldn't say as to any particular dates.

Q. Which one of you had charge of the work at that time?

A. Mr. Ferrier had charge of the entire work, as manager.

Q. And you were under Mr. Ferrier?

A. Yes, sir.

(Testimony of Richard A. Sullivan.)

A recess was thereupon taken until two o'clock P. M. [547]

At two o'clock P. M. the hearing was resumed.

**[Testimony of Richard A. Sullivan, for Defendant (Recalled).]**

RICHARD A. SULLIVAN, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. Do you desire to make any correction in your testimony, Mr. Sullivan?

A. Why, there may be some little points that I might; yes.

Q. All right; do so.

A. Regarding being one of the locators of the claims on Montpelier Creek, I think I qualified it by stating that I was a locator of a portion of the claims. I will qualify that further. To the best of my recollection, I was simply a locator on the Wizard only.

Q. On any of the claims that are involved here?

A. Of the claims that are involved, yes. That is my recollection now.

Q. I will ask you whether or not at the time you had the conversation with Mr. Duffield and Mr. Jeffs, up in the canyon, or at any other time or place, you stated to them or either of [548] them that you were pleased that they were not intending to make placer locations over the placer locations of these

(Testimony of Richard A. Sullivan.)

locators, the predecessors in interest of the San Francisco Chemical Company?

A. I did not, sir. Any evidence or testimony to the contrary is an absolute falsehood. There was no occasion for it, and it wasn't mentioned.

Q. You didn't express yourself at all as to their making placer locations, or otherwise?

A. Not as to placer locations, no, sir. The lode and the placer contention was the only thing that was discussed, they contending that it was lode, and I placer.

Mr. BUDGE.—I will ask you gentlemen whether it may be stipulated that those conveyances to the San Francisco Chemical Company were made on August 28th, 1906?

Judge DEY.—Go on and state it just as you did awhile ago.

Mr. BUDGE.—It is stipulated and agreed that the deeds of conveyance from the predecessors in interest of the San Francisco Chemical Company to the said San Francisco Chemical Company, of the placer claims involved in this suit, were made on the 28th day of August, 1906, acknowledged September the 13th, I think it was, 1906.

Judge DEY.—Yes.

Mr. BUDGE.—And that said deeds were recorded [549] on the 27th day of July, 1910.

Judge DEY.—All right.

Mr. BUDGE.—I would have that September 13th—acknowledged and delivered September 13th, 1906.

I think that is all by this witness.

(Testimony of Richard A. Sullivan.)

Cross-examination.

(By Mr. JACK.)

Q. Did you inform Mr. Duffield in that conversation whom you represented?

A. As stated before, I am not sure whether I did or not, any more than that we were the owners of the claims that appeared of record at that time.

Q. Did you say that to Mr. Duffield?

A. I don't know that I used that particular language. That was the intent.

Q. How near that language did you use?

A. I couldn't say. I don't remember just what I did tell him in that particular.

Q. You didn't know, as a matter of fact, in whom the legal title was vested at that time?

A. Yes, sir; but I don't remember now, clearly. I said, to the best of my knowledge, I was satisfied that the deeds had been made from the owners to the San Francisco Chemical Company prior to that, but as to the exact date I am not absolutely sure, and therefore I can't testify absolutely upon that point.

Q. Well, what I am getting at is, whether Mr. Duffield [550] knew whom you purported to represent?

A. He had access to the records to find out who were the legal owners of those claims, as they appeared of record. They were public property.

Q. If those deeds for the claims, conveying them to the San Francisco Chemical Company, were made in 1906, and not recorded until 1910, do you know



(Testimony of Richard A. Sullivan.)

whether that was held in escrow under some agreement? A. I don't think so.

Q. You don't think so? A. No, sir.

Q. You know no reason for not recording it prior to 1910? A. I know of none; no, sir.

Q. In speaking of the ledges and the placer locations, in that conversation with Mr. Duffield, did he tell you that he had made ledge locations?

A. I looked over it for my own information. I went over the ground and ascertained the location of it personally.

Q. And was anything said to the effect that you were glad that he had not made placer locations?

A. Absolutely nothing, sir—absolutely nothing.

Mr. JACK.—That's all.

Mr. BUDGE.—That's all. [551]

**[Testimony of Fred. B. Weeks, for Defendant.]**

FRED. B. WEEKS, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

Mr. BUDGE.—Now, Judge Dey, I would like to have the same stipulation which we had with reference to the experts on the other side, apply to this testimony.

Judge DEY.—All right.

Mr. BUDGE.—It is stipulated and agreed that in the cases of Morse S. Duffield and Lewis A. Jeffs, Complainants, vs. the San Francisco Chemical Company, Nos. 568 and 569, pending in the United States

(Testimony of Fred B. Weeks.)

Circuit Court for the District of Wyoming, and in the case of Morse S. Duffield and Lewis A. Jeffs, Complainants, vs. the San Francisco Chemical Company, pending in the Circuit Court for the District of Idaho, that the testimony of F. B. Weeks, C. L. Breger and Robert Bell, witnesses for the defendant, may be taken at the same time, and may be treated and considered as the testimony in each of said cases, with like effect as if the said witnesses had been sworn and examined in said causes separately. This stipulation is made for the purpose of saving time and expense.

Q. What is your name? [552]

A. Fred. B. Weeks.

Q. How old are you, Mr. Weeks? A. 46 years.

Q. Where do you reside?

A. Los Angeles, California.

Q. What is your occupation?

A. Geologist and mining engineer.

Q. How long have you been engaged in the business of a geologist and mining engineer?

A. Since 1890.

Q. And what preparatory work did you have prior to 1890?

A. My early education was obtained in the common schools of New York State; then, in what is known as an academy; and subsequently I took a special course in geology, mineralogy, chemistry, in what is now known as the George Washington University, of Washington, D. C.

Q. And commencing with 1890, what was the na-

(Testimony of Fred B. Weeks.)

ture of your work as a mining engineer and geologist?

A. I was in the employ of the United States Geological Survey from December 1st, 1890, to April, 1908.

Q. What position, if any, did you hold in the Geological Survey during that period?

A. Well, I held various positions, and had various official names; but the work which I was doing was entirely in connection with the geological branch of the Geological Survey.

Q. And in what portions of the country were you employed as a geologist in the Geological Survey?

A. With the exception of some work in New York, Maryland [553] and Kentucky, it has been entirely in the Rocky Mountain and other Western States.

Q. What were your duties as a geologist on the Survey, during the eighteen years that you were on it?

A. My duties were those of examining such portions of the country as I was given instructions to do at various times, as to the character and distribution of various geological formations, the economic productions that were contained in them; occasionally in mapping certain portions to show the distribution of geological formations; and that general work which pertains to geology.

Q. Did you have anything to do with making reports of your investigations?

A. Yes, sir; I made quite a number.

(Testimony of Fred B. Weeks.)

Q. And what kinds of properties and what classes of mining properties were you assigned to investigate from time to time?

A. My examination of mining properties was usually made in connection with geological work in the areas in which these particular mines or properties occurred, and the instructions for field work were not definite as to any particular mine, but included anything of economic importance within the area within which I was working.

Q. Now, for what period of time were you assigned to work or investigate mining properties and geological conditions within the Rocky Mountain States?

A. I think the first year was 1894, and every Summer from that time until 1907, including 1907, I spent some portion of [554] the Summer, varying from one to five months, in field work, in some of the Western States.

Q. And by "Western States" what do you mean?

A. I mean the Rocky Mountain States, from and including Wyoming, Colorado and Montana, west to the Pacific Coast.

Q. Did you at one time occupy the position of Assistant Director of the Survey?

A. No, sir; I never occupied that position. I was the Field Assistant of the Director of the Geological Survey from the time when Director Walcott was appointed, I think it was the year 1903—it was either 1903 or 1904—to the close of his administration, in 1906, I think.

Q. Now, in pursuance of your duties upon the

(Testimony of Fred B. Weeks.)

Geological Survey, what properties, or classes of properties, rather, came under your observations in making these geological investigations?

A. My work included examinations of both lode and placer mining operations, but for the most part was confined to veins or lodes.

Q. And particularly in what States?

A. South Dakota, and Wyoming, Montana, Idaho, Utah, Nevada and California.

Q. Have you examined the lode formations and the placer formations generally throughout these States you have named?

A. Well, I can only say that in the areas where I have been at work, I have examined quite a good many. Of course, there are many parts of the States named that I have never visited. [555]

Q. Calling your attention to the Plaintiff's Exhibit 1, I will ask you whether or not you are familiar with the deposits of calcium phosphate in the group of claims shown on that exhibit? A. I am.

Q. And when, Mr. Weeks, did you first become interested in the investigation of phosphate deposits in the United States?

A. Well, I might say that I first began the study of phosphates from the literature of the subject in about 1892, and that I read practically all the papers that were published on the phosphates of the United States from that time to the present. My actual field work—my examination of phosphate deposits—began in the fall of 1906.

Q. What literature, Mr. Weeks, have you read,



(Testimony of Fred B. Weeks.)

that you now call to mind, as covering the treatment of the phosphate deposits—that is, that treated of the phosphate deposits?

A. Well, Wyatt's book on The Phosphates of North America is one of the most comprehensive treatises on the subject. The publication by Penrose and Shaler, which was published as a bulletin of the U. S. Geological Survey, gave a *résumé* of what was known at that time as to the phosphate deposits of the world, and particularly as to the phosphates of North and South Carolina, Alabama, and Florida. The publications of Eldredge, who examined the Florida phosphates for the U. S. Geological Survey. The publications of Hayes, who examined and reported upon the phosphates of Tennessee. The reports upon the phosphates of Arkansas—I can't speak the man's name at the present time. I can refresh my memory from one of those pamphlets [556] if you wish that name.

Q. Have you read the treatment of the subject by Mr. Bryner?

A. Yes, sir; that was on the deposits of Arkansas, also, by Professor J. C. Bryner. But the one I have reference to is in the Report of 1907.

Q. Calling your attention to Bulletin 436, by George H. Gerty; have you read that?

A. Yes, I have read that. I have also read the report of Gale and Richards upon these western phosphates, and one of the bulletins of the Agricultural Department by Waggaman. I might explain my knowledge of the literature a little further by say-

(Testimony of Fred B. Weeks.)

ing that from 1892 to 1907 I prepared and published annually for the Geological Survey a bulletin called The Bibliography and Index of North American Geology, Paleontology, Petrology and Mineralogy; that each year this compromised an average of about 1200 different articles, a large number of which I read entirely, and all of which I went through for the purpose of indexing them for this publication, and in that way I became very familiar and conversant with all geological work that was going on in the United States. Those publications made about fifteen volumes.

Q. And that was a part of your work?

A. That was a part of my official work as a geologist on the Geological Survey.

Q. And during what periods?

A. From 1902 to 1906 or 1907—I think it was 1907, the last one.

Q. Now, coming to the field work which you did on the Geological [557] Survey, investigating the phosphate rock deposits; when did you say that commenced? A. In the fall of 1906.

Q. And what part of the field did you cover during that time, or at that time?

A. The phosphate ground as it is shown on Exhibit 1, and the phosphate on Thomas's Fork, or rather, Raymond Canyon, in Wyoming and at Cokeville, Wyoming.

Q. Just a minute, Mr. Weeks. The phosphate deposit that you referred to in Raymond Canyon, I will ask you whether that is the deposit that is shown on

(Testimony of Fred B. Weeks.)

Plaintiff's Exhibit "B," J. W. C.—that is the endorsement—and which is covered by the Frances placer mining claim and the Freyerson lode mining claim?     A. Yes, sir.

Q. And also the deposit embraced within the Raymond placer mining claim, and the Japan and China lode mining claims?     A. Yes, sir.

Q. As shown on "Plaintiff's Exhibit 'A,' J. W. C."?     A. Yes, sir.

Q. And these are at Raymond Canyon?

A. Yes, sir, in that vicinity.

Q. In the State of Wyoming?     A. Yes, sir.

Q. All right. Proceed, Mr. Weeks, and tell us what other ground was covered by you.

A. I think that was all the ground I covered in 1906.

Q. All right. Where next? [558]

A. In 1907 I examined the deposits east of Ogden, near Devil's Slide; those on Twelve Mile Creek, west of Woodruff; I re-visited the Cokeville area, and the Raymond Canyon area; also examined the deposits at what is known as Hot Springs, on the east side of Bear Lake, and spent considerable time on the deposits at Montpelier; then those in Georgetown Canyon, west of Georgetown, Idaho, and in the area of what is known as Swan Lake, and the mountains directly east of Soda Springs, Idaho.

Q. Did you visit the Crawford Mountain country?

A. I omitted the Crawford Mountain country. I examined also the phosphate beds throughout their whole extent of the Crawford Mountains.

(Testimony of Fred B. Weeks.)

Judge DEY.—In what year?

A. In 1907; and also in the hills two or three miles west of Sage, Wyoming, which are an equivalent extension of the Crawford Mountains.

Q. Now, in 1908 what field did you visit?

A. In the summer of 1908 I went to Cheyenne, Wyoming, and in the Rocky Mountains about 15 or 20 miles North of Cheyenne I found this phosphate horizon. Then, I went to Laramie, Wyoming, and in the mountains two or three miles west of Laramie, Wyoming, I found the phosphate horizon; and then west of Laramie, in the central part of the State, on the line of the Union Pacific—I can't recall the name of the station now—but about three miles west of that station I found the phosphate horizon. I can't recall that name just now. Then, I made a short trip into Western Montana, but I didn't find the phosphate horizon there—that is, what I was looking for. I think that was all the work I did in 1908. [559]

Q. In 1908? A. Yes, sir.

Q. Now, in 1909 did you do any work in the field for the Geological Survey?

A. No; I wasn't in the Geological Survey during 1909.

Q. Not during 1909? A. No.

Q. When did you end your service in the Geological Survey?

A. I think it was April, 1908—

Q. So a portion of the work that you did in 1908—

A. —was simply my own personal investigation of the subject.



(Testimony of Fred B. Weeks.)

Q. Did you make a report on the phosphate deposits near Montpelier, and which was published as a bulletin of the Geological Survey in 1907?

A. That was a part of the report.

Q. Covering phosphates?

A. My report for 1906 covered the area which I stated I had worked in in 1906; that covered the Montpelier, and the property that is now in question here.

Q. And the publication to which I have referred was a part, you say, of the report?

A. That was the report—the publication.

Q. Bulletin No. 340, so called? A. Yes.

Q. And under the title of “Contributions to Economic Geology”? [560] A. Yes, sir.

Q. Now, Mr. Weeks, are there any other areas of this phosphate deposit which you have personally visited and investigated, other than those you have described and named?

A. I think I omitted to state that in the summer of 1908 I found the phosphate horizon east and southeast of Salt Lake City, about from two to five miles.

Q. Five miles?

A. From two to five miles; one locality is about two miles east, and the other about five miles to the southeast. I don't recall now that I have done any other field work in any other area.

Q. At what other times other than you have mentioned have you visited and investigated and inspected the phosphate deposits comprised within the boundaries of these placer claims shown on Plaintiff's



(Testimony of Fred B. Weeks.)

Exhibits 1, "A," and "B"?

A. I don't recall the dates of any other work, except what I have done in connection with this suit. I have been at Montpelier a good many times, and have been up on this ground quite a good many times, at other times than I have actually mentioned. I don't remember the exact times. And at such times, of course, I made observations, more or less.

Q. Now, are there any other phosphate areas of which you have information from the work of other geologists, other than the areas that you have described, which you have not personally visited?

A. I don't recall of any except those that I named where I had read the reports, in regard to Tennessee and Arkansas, and the Florida and South Carolina deposits. [561]

Q. But I am speaking of the phosphate deposits of the West. Calling your attention particularly to the region of Gray's Lake; have you visited that particular country? A. No, sir.

Q. And have not investigated the deposits there?

A. No, sir.

Q. Well, I will ask you if there are deposits, as shown from the publications of the Geological Survey, in that section? A. Yes, sir.

Q. Now, are there any similar deposits which you have not visited, but which have been ascertained to exist, by the Geological Survey?

A. There is one in Western Montana, and there are others in Idaho and Wyoming, of which I have knowledge from conversations with the geologists of

(Testimony of Fred B. Weeks.)

the Survey who have studied those regions.

Judge DEY.—I move to strike that out, as improper and incompetent—a conversation.

Q. You know of them, however, from the publications of the Geological Survey, and from your investigations of them?

A. In so far as they have been published by the Survey, I know of them.

(A map marked Defendant's Exhibit 1 was placed upon an easel.)

Q. Calling your attention, Mr. Weeks, to Defendant's Exhibit 1, did you prepare that exhibit?

A. I did. [562]

Q. And what does it represent?

A. As stated on the legend on the map, the base of the map is from the maps of the United States Land Office.

Q. What do you mean by "base of the map"?

A. That is, in starting I took from the Land Office maps of Idaho and Wyoming and Utah, commencing with certain townships and certain ranges, and drawing in light lead pencil, marked the various townships on a scale of one inch to three miles, taken from those maps; then upon that I platted from those maps the streams and the railroads, the locations of the towns, and of Bear Lake, Gray's Lake, and that was practically all the material I took from the Land Office maps. The colored portion of the map, which the legend shows is upper carboniferous strata, black lines, indicates position of phosphate series, arrows indicate direction of dips.

(Testimony of Fred B. Weeks.)

Judge DEY.—What is that last?

A. Arrows indicate direction of dips. Areas not marked—that is, not colored,—contain strata older or younger than upper carboniferous. The geology that I placed on there as the upper carboniferous, and the location of the position of the phosphate series, is based upon my own field work, with the exception of the area near the head of the Ogden River, and of the area which is shown between Gray's Lake and Blackfoot River.

Judge DEY.—Just point to that.

(The witness did so.)

A. Those two areas were platted upon this map from publications of the Geological Survey. All the others are based upon my own observations. [563]

Q. Does the colored portion of the map—the green colored portion of the map—purport to represent the upper carboniferous strata that is exposed?

A. That is exposed at the surface. Of course, it underlies a great deal of that country where it is covered by later rocks; but the areas shown there are the areas upon which it appears at the surface.

Q. Now, recurring to your examination of these various areas at the times you have mentioned, I will ask you whether or not the deposit—the phosphate rock which you found at these various—in these various fields, from the Weber River deposit, north to the Soda Springs district, whether they are similar in texture and in manner of occurrence?

A. They are very similar in all their characteristics.

(Testimony of Fred B. Weeks.)

Q. Throughout the whole area?

A. Throughout the whole area.

Q. You may describe, Mr. Weeks, as a geologist, the manner in which this formation was brought about—I mean the formation of this phosphate deposit.

Judge DEY.—That is objected to as wholly immaterial, for the reason that the question of the origin of how it was originally brought about has no bearing on the determination of the question of whether it exists in the form of a lode or placer.

Mr. JACK.—Let that objection go to all this class of testimony.

Mr. BUDGE.—Oh, yes. [564]

Judge DEY.—Why, I believe that is so understood.

Mr. BUDGE.—Yes. All right. Go ahead, Mr. Weeks.

A. The beds, which are formed of calcium phosphate, are a part of a series of sedimentary deposits that are several thousand feet thick. The beds, or bed, which immediately underlies the lowest stratum of phosphate rock is a silicious limestone. This was formed as all—in the same general way as limestones that are formed in the bed of the ocean; and the lowest phosphate layer was laid down or deposited immediately upon this limestone. This lowest phosphate bed is a two-foot layer of fossiliferous limestone, and succeeding immediately above are other layers of phosphate and shale and limestone. So that we have what is called the phosphate series, beginning at the top of the silicious limestone, and continuing



(Testimony of Fred B. Weeks.)

up through a thickness of from 60 to 200 feet, of these alternating beds of phosphate and limestone and shale, to a series of cherty limestones of considerable thickness, which overlie the phosphate series. The conditions of sedimentation, which began with the deposit of the lower bed, and continuing with its variations through this thickness of 40 to 200 feet, was ended at the beginning of the formation of this overlying cherty limestone. Those conditions of sedimentation prevailed over the area shown upon Defendant's Exhibit 1, so that while there are variations in the thickness of this series, and in the relations of a shale bed to a phosphate bed, or to a limestone, yet as a whole they were very similar throughout that whole area.

Q. What have you to say as to the texture of this phosphate [565] rock?

A. The rock is granular in its character, or, more technically, composed of oolites, which are rather loosely cemented together, and there is almost always a comparatively small amount of cemented material, the oolites forming a very large proportion of the rock mass.

Q. And from your study of geology, what is the manner in which oolites are formed?

A. When you examine the phosphate rock in a hand specimen, the first examination one makes of its granular character it seems to be made up of grains, which are these little oolites; and if you take a piece of this phosphate rock and grind it down until it is very thin and spread it out upon a sheet of



(Testimony of Fred B. Weeks.)

glass, and grind it so that you get cross-sections of these oolites, so that you can observe through the microscope the internal structure of these oolites, you will find that they are made up of concentric layers of I might call them concretions; they are layers of material, one layer upon another, of course exceedingly thin, and you will find in the center of those oolites frequently a small particle of calcite, which is shown by the striations of the calcite material, forming the nucleus around which these materials have accumulated forming the oolite; or you will find in the center of the oolite another oolite, which shows under the microscope to have been broken in two, and its edges made rough, as if it had been rolled around upon something. Such a piece of broken oolite forms the center, or the nucleus of the subsequent oolite which is formed, which you find forming these concentric forms or layers. So that the study of these oolites indicates from their structure, and from the [566] material of which they are made, that they were formed upon the ocean bottom, in which the water must have been comparatively quiet; nevertheless, there was sufficient movement of the water, or currents, to move these oolites along, to abrade them, and in that movement they were gathering from the surface underneath the water, or from material in suspension in the water, the materials which formed the oolites. They were the first things that were formed in this phosphate rock. The cementing material, which is the calcium carbonate, was probably laid down in a form just about the same time

(Testimony of Fred B. Weeks.)

that the oolites were formed, or immediately thereafter, and the whole mass of the phosphate rock is made up of these oolites, and of the calcium carbonate cement, which binds the oolites together into a rock stratum.

Q. Are oolites formed in any other manner than by the movement of water, or the contact with water?

A. I cannot conceive of any other process of how they could have been formed other than that.

Q. And I will ask you whether, from a geological standpoint, whether it would be possible for the oolites to have been formed after the consolidation of them, or the cementing process had taken place?

A. From my study of the rock in the field, and from these microscopic studies which I have just described, it seems to me that the phosphate rock was formed grain upon grain—grain after grain—until the whole thickness—until the sedimentation—the conditions of sedimentation changed, so that oolites were no longer formed, and that it was a rock mass, |[567] in its present form and constitution, at the time those conditions changed, and the sedimentation of the overlying limestone began. So that I have never discovered any evidence to indicate that there has been any other material added to the bed of phosphate rock since it was formed in that way.

Q. Now, after its formation in the way in which you have described, by the aggregation of oolites and this cementing material, it was after that that it became solidified? A. Undoubtedly.

Q. Now, in the process of solidification, or in the

(Testimony of Fred B. Weeks.)

process of this bed becoming solid, is there any way in which the oolites might have been formed in that process?

A. I don't think it would have been possible.

Q. What other evidence have you discovered from your investigations of these deposits, that they are of—that the deposition of them was in water, or that it is a marine deposition?

A. The limestone which immediately underlies the lowest bed of phosphate is a fossiliferous limestone, containing shells that grew and developed in marine waters. The two-foot bed of limestone which I have mentioned as overlying the lower phosphate bed also contains many marine fossil shells, and the other layers of phosphate and lime and shale that comprise the phosphate series are each and every one of them fossiliferous; that is, they contain shells of marine origin; and the limestones—the cherty limestones which I have mentioned, which overlies the whole phosphate series, is also very fossiliferous, containing numerous marine shells. Those conditions prove beyond any [568] question that those beds were sedimentary, and that they were laid down in the bed of an ocean.

Q. Are those fossils in evidence just occasionally, or do they abound in this deposit?

A. Oh, they are very abundant throughout the phosphate series, and also in the limestones above and below the phosphate series.

Q. What condition have you observed as to these fossils at the plane which separates the phosphate

(Testimony of Fred B. Weeks.)

bed from the layer of limestone that is immediately above the lower phosphate bed?

A. The limestone bed that immediately overlies the lower phosphate bed contains a great number of fossils, especially of two species of the genus *omphalatrochus*. These two species that I mention are very abundant throughout this limestone—very characteristic limestone. They have never been found in this western area to my knowledge in any other layer of limestone, and in a great many places you will find them so abundant in this layer of limestone that there will be very little material between them, and the line between the top of this phosphate bed and the bottom of this fossiliferous limestone is very clear and distinct, and in many of the open cuts and tunnels where this bed is exposed, this bed of limestone is exposed so that you see the lower edge, or side rather, of the mountain, you will see these fossils sticking out in great numbers, so that if you break away the phosphate from the limestone you see that the phosphate is lying right up against the limestone, and against these fossils, which are so very numerous.

Q. Now, are those fossils the fossils which are treated in the pamphlet by Mr. Gerty? [569]

A. Yes, sir, they are described in that pamphlet.

Q. Described in the treatment of what is known as The Fauna of the Phosphate Beds?

A. Yes, sir.

Q. Of the Park City formation? A. Yes, sir.

Q. What is meant by that Park City formation?



(Testimony of Fred B. Weeks.)

A. In describing the sedimentary formations that make up the crust of the earth, the geologist makes certain divisions of them, usually according to variations in their lithological characters, and to those divisions we give names, and those names are generally from some place where that division is well exposed. The division which contains this phosphate series is well exposed at Park City, Utah, and in connection with the work of the Geological Survey at that point they have described and named the formation as the Park City formation. That formation in this area contains the phosphate series.

Q. Calling your attention to these deposits as they appear in the claims referred to or set forth and described in Plaintiff's Exhibit 1, and in Plaintiff's Exhibit "A" and "B," you may give us a description of the manner in which these beds occur within these areas.

A. They occur as a part of the sedimentary strata which are exposed in the mountains—the Preuss Mountains, and the Sublette Mountains—

Q. Where are the Preuss Mountains, Mr. Weeks — A. The Preuss Mountains extend—

Q. —with reference to Montpelier? [570]

A. Directly east.

Q. And the Sublette?

A. They are still farther east, and a little south, in Wyoming.

Q. Yes—all right.

A. These beds, which were originally deposited in a horizontal form, are now standing at dips in



(Testimony of Fred B. Weeks.)

these two areas of which I am speaking particularly, ranging from 10° to nearly vertical. They occur between the—or rather, they form a part of the great series of strata which preceded and succeeded the formation of the phosphate series.

Q. Yes. How does the dip conform to the slope of the hills in which the deposit is found upon these claims; is it the same or different?

A. Well, it varies from place to place. In some places the dip of the bed conforms quite closely to that of the slope of the surface; in other places the dip of the bed is very much steeper than the slope.

Q. Have you examined the workings upon these various claims? A. I have.

Q. On what claims? On all the claims—the Wilmington, Colcock, The Inman, Winter, Wonder, Winslow and Wizard claims?

A. I think I have examined every opening that has been made upon the lower phosphate bed within those claims?

Q. And the Waterloo? A. Yes, sir.

Q. And are you familiar with the boundary lines and corners [571] of the lode claims of the complainants, named on this Exhibit 1—the Obey, Obed, etc.?

Judge DEY.—Call that plaintiff's.

Mr. BUDGE.—Plaintiff's Exhibit 1. Yes, sir; pardon me.

Judge DEY.—Yes.

A. I have been to a great number of their posts. I am familiar with their location.

(Testimony of Fred B. Weeks.)

Q. With the shape of the claims, and with the boundary lines thereof? A. Yes, sir.

Mr. BUDGE.—For purposes of illustration, we offer in evidence Defendant's Exhibit 2, showing the extent of the deposit and the approximate location of it, throughout the area shown on that exhibit.

Said map was marked Defendant's Exhibit 2.

Q. Calling your attention to Defendant's Exhibit 2, did you prepare that map, Mr. Weeks?

A. I did. I prepared the map from which that is made. That is a photograph of the map I made.

Q. And the map you made, in what manner did you make it?

A. The Plaintiff's Exhibit 1, I had a blue-print made of that exhibit, and then upon that blue-print I put on all the other features that are on this Defendant's Exhibit 1—

Q. Exhibit 2.

A. Exhibit 2; and then a tracing was made on linen of that blue-print, and a negative made of that tracing; and this Defendant's Exhibit 2 is a print of that negative. [572]

Q. So far, then, as the boundary lines of the various placer and lode claims are concerned, this is identical with Plaintiff's Exhibit 1? A. Yes, sir.

Q. And as showing also the tunnels and cuts and other workings, such as stripping, etc., which are shown on the Plaintiff's Exhibit 1?

A. Yes, sir.

Q. And are there any other features upon this exhibit which do not appear upon the Plaintiff's

(Testimony of Fred B. Weeks.)

Exhibit 1—any other markings?

A. Yes, sir, there are a number of things that I have put upon there.

Q. Well, describe them, and explain them, please.

A. In the first place, with the blue-print of Plaintiff's Exhibit 1 in hand, I went upon the ground, and beginning at the Waterloo mine, or the Waterloo placer, I followed the outcrop of the lower phosphate bed and noted its position upon this blue-print. That is indicated by the heavy black line, the legend on this exhibit stating: "Heavy black line indicates position of main phosphate bed, as shown by tunnels, open cuts and natural exposures." As I said, with this blue-print in hand, starting from the Waterloo mine, I proceeded along the outcrop, a very natural outcrop, to the various open cuts and tunnels that were made all along upon it from that point to the point where it passes underneath the surface, near the westerly end of the Tennessee lode. The outcrop again begins on the other side of the gulch—on the north side of the gulch—directly north from the Tennessee lode. [573]

Q. Well, just a minute. Yes, that is north, isn't it?

A. Yes—and I followed the lower phosphate bed to and through the Arkansas lode and upon the Winslow placer, through the Mount Pleasant lode, as shown upon Defendant's Exhibit 2, the point where it passes underneath the surface, on the southwest end of the Mount Pleasant lode. I began again on the opposite side of Montpelier Creek Canyon, near

(Testimony of Fred B. Weeks.)

the southwest end of the Overton lode, and followed the bed through the Overton, Cumberland, Fentress, Jimtown, Obed and Obey lodes, and examined the tunnels marked 1 and 2 of the Obey lode. I then followed the bed up the slope of the ridge to the point which is marked 70 ft. tunnel on the Wilmington placer. From there I proceeded in a general southerly direction along the slope of this ridge, the bed being shown by numerous open cuts, to a point on where the bed crosses the ridge and takes a generally—the outcrop takes a general northerly direction. This was shown by some natural exposures and by open cuts to extend to and beyond the point marked B on the Wilmington placer. At the time I examined the outcrops upon the Arkansas lode and Mount Pleasant and Overton lodes, I made an examination of the phosphate series and of the beds underlying and overlying the series, for the purpose of making the cross section, which is noted as C D upon Defendant's Exhibit 2, which extends from the point C on the north side of the Wizard placer, to the point D on the west side of the Montpelier Creek, within the Winslow placer.

Q. Do you mean the north side of the Wizard placer, or the east side?

A. I mean the east side of the Wizard placer—the east side of the Wizard placer. I also— [574]

Q. Just tell us what this cross-section shows, Mr. Weeks.

Judge DEY.—Where is it?

(The witness indicated upon said exhibit.)

(Testimony of Fred B. Weeks.)

A. That is the cross-section.

Q. That is cross-section C D, so designated?

A. The cross-section C D shows the point of outcrop of the lower phosphate bed upon the Arkansas lode, and extending through and underneath the hill or ridge, through the tunnel marked 34 on the Mount Pleasant lode, where the phosphate bed again comes to the surface and outcrops. From the tunnel 34 in the Mount Pleasant lode, along the line of the section across Montpelier Canyon Creek, to the point where the position of the lower phosphate bed is shown on the Overton lode, the phosphate bed and all the strata above it, and those below it down to the creek, have been eroded, and that is shown on the cross-section C D by the statement "Phosphate Series eroded." From the point on the west side of Montpelier Creek the position of the outcrop of the bed, to the point D, the phosphate bed dips to the west into the hills. This section shows that from the outcrop of this lower phosphate bed on the Arkansas lode it dips to the west underneath the hill through the tunnel 34.

Q. On what claim?

A. On the Mount Pleasant lode. The strata which are marked on the section C D as underlying silicious limestones, are shown in natural exposures on the Mount Pleasant lode on the slope leading down to Montpelier Canyon Creek, and also in part are shown on the Overton lode on the slope going up the ridge to the west. [575]

Q. Will you explain to us the section A B which



(Testimony of Fred B. Weeks.)

you have on this map?

A. The section marked A B shows the cross-section from the point A, on the west line of the Obey lode, to the point B, within the Wilmington placer. This section shows that from tunnel 4 of the Obey lode, the lower phosphate bed, and the overlying and underlying strata as well, dips to the west at an angle of  $20^{\circ}$ . From tunnel 4 of the Obey lode to the tunnel marked 70 ft. tunnel on the Wilmington placer, the entire phosphate series, as well as a portion of the underlying limestone, has been eroded by Gertch Hollow. From the point on section A B marked tunnel 70 ft. in phosphate bed, to the end of the section, at the point B, within the Wilmington placer, the section shows the occurrence of the phosphate series underneath the ridge, with the overlying chert limestone. This section shows that the phosphate series, beginning from the point B, dips to the west, and extends through to the 70 foot tunnel, and from that point to tunnel No. 4 the Obey lode is eroded by Gertch Hollow. From tunnel 4 of the Obey lode to the end of the section at A, the phosphate bed and overlying strata are dipping to the west into the ridge. On the Waterloo placer, from the point marked E to F, I made another section, showing the position of the lower phosphate bed, and I have also noted upon Defendant's Exhibit 2 the lower and upper tunnels of the Waterloo mine, with two raises therein, and the point where this section cut through the mine. As shown by the legend, the arrows which I have placed upon

(Testimony of Fred B. Weeks.)

here, with the figures attached thereto, shows the dip of this lower phosphate bed at the position [576] of the arrows, and the direction of the point of the arrows.

Judge DEY.—What are the figures?

WITNESS.—Well, they vary from place to place.

Judge DEY.—Well, what do they indicate?

WITNESS.—They indicate the dip—the degree of the dip. For instance, above the Waterloo mine the dip marked here is  $24^{\circ}$ .

Q. Now, Mr. Weeks, commencing at the Wayne lode, or at the south end of the Wizard placer, and tracing the deposit as you have it marked by the black line, and as indicated on Defendant's Exhibit 2, you may describe the manner in which this deposit occurs, and the manner in which it is exposed.

A. This lower phosphate bed has a dip to the west, varying from  $12^{\circ}$  to  $35^{\circ}$ , and a north and south strike. The strike of the bed is always at right angles to the dip, and in places there are slight changes in the dip, so that there are slight changes in the strike; but as a general proposition the series throughout the whole extent of this area shown on Defendant's Exhibit 2 has a westerly dip and a north and south strike.

Q. Now, how does the exposure of the phosphate rock, as shown on this exhibit, conform—how nearly does it conform to the strike of the deposit?

A. As I have stated, the heavy black line indicates the position at the surface of the lower phosphate bed; so that, as can be seen on this exhibit, it is in a

(Testimony of Fred B. Weeks.)

very irregular line; while the strike of the bed is essentially north and south everywhere, [577] the strike of the bed being always at right angles to its dip.

Q. What is the cause of the irregularity of the exposure? To what physical condition is it due?

A. It is entirely due to the difference in the dip of the bed, but it is in a much greater degree the erosion of the surface of this mountain slope, which causes the outcrop, the exposure of this phosphate bed, to be so irregular.

Q. So that, standing upon the ground, or at the point where the phosphate rock is exposed on the Arkansas lode claim, or within the Wizard placer, and looking toward Montpelier Creek, down the hill, the irregularity of the line of exposure is due, is it or is it not, to erosion?

A. It is due to the erosion.

Q. Yes, at the various points where these lines curve and are angular?

A. It is due to erosion of the surface.

Q. Take, for example, the place here indicated on the map as a gulch, which proceeds from the point where the figures 1494—what is that—6/10ths?

A. Yes.

Q. —1494.6, where it is shown that the gulch runs from where those figures are, up to the corner posts of the Mount Pleasant and Arkansas lodes claims. I will ask you whether or not it is apparent from the physical conditions there that the phosphate deposit up that gulch has been eroded, and left

(Testimony of Fred B. Weeks.)

the outcrop of the deposit lower down in the gulch than it would otherwise have been except for erosion?

(No answer.) [578]

Q. Can you explain that condition there?

Mr. JACK.—I would like to have the question read.

(Said question was repeated.)

A. That is true, that it is shown by the physical conditions, for the reason that on the north side of this gulch, and just to the north of the figures 823.9, the limestones which are immediately underlying the lower phosphate bed are exposed upon the surface, and if the phosphate bed had not been eroded from this region the outcrop of the bed would have extended up through the area which I am trying to locate.

Q. And the outcrop, or the bed of phosphate rock, would likewise have been one continuous bed across what is now the channel of Montpelier Creek, had it not been for the erosion? A. Yes, sir.

Q. And that is true also of the gulch here along the Tennessee lode claim, where the bed has been taken out by reason of erosion? A. Yes, sir.

Q. And the irregularity of the outcrop in all these places, as well as a great many others shown on this map, is due to the erosion of the surface, and also to the erosion of the bed of phosphate rock?

A. Yes, sir.

Q. Now, what did you find the condition to be as to erosion along the side of the hill? You may explain to us how you found the conditions along the



(Testimony of Fred B. Weeks.)

side of the hill, where erosion has taken place by drainage down these different gulches, as it [579] affects the phosphate bed?

A. Well, as shown on Exhibit 2, in the two gulches which are shown on the Mount Pleasant lode the outcrop of the bed extends up the opening or cut of the gulch.

Q. Now, did you find, in making this investigation as to the line of exposure of this phosphate deposit, that the deposit went without the boundary lines, or was exposed without the boundary lines of the lode claims shown on Defendant's Exhibit 2 and on Plaintiff's Exhibit 1?

A. On the Defendant's Exhibit 2 it goes outside of the lode claims in all the places where this black line is shown to extend beyond the limits of those lodes.

Q. You may explain and specify the particular points at which you found the phosphate deposit exposed outside of the lode claims shown on the exhibit.

A. At post 5 on the Maury lode, 19 feet east from the post 5, there is an exposure of the phosphate bed, and from that point along this curved black line to post 2 of the Maury lode the position of the lower phosphate bed is indicated by the outcrop of the underlying limestone on the slope above it, and the phosphate float extending over the surface to the west of this curved line.

Mr. JACK.—The Maury and Tennessee lodes are not involved in this suit, Mr. Weeks?

Mr. BUDGE.—No, they are not.

A. Passing to the Hickman, the phosphate bed is exposed in an open cut a few feet north of the post



(Testimony of Fred B. Weeks.)

No. 10 of the Hickman.

Q. Where is that? [580]

(The witness indicated upon said exhibit.)

Q. Yes—all right.

A. From that point the outcrop beds a little to the southeast, and that outcrop is shown by outcrops upon the surface of the phosphate bed around and above post 5 of the Hickman, and down the slope to tunnel 48 on the Hickman lode, the lower phosphate bed extending without the boundaries of the Hickman lode as shown by this black line on Defendant's Exhibit 2. Do you care for this? (Indicating upon exhibit.)

Q. Yes, I believe I will have you explain that also, with reference to the Tennessee lode, Mr. Weeks.

A. From tunnel 48, which is at or near the discovery point of the Hickman lode, the phosphate bed extends to the north, and is exposed in tunnel 47. Before reaching post 6 of the Tennessee lode the limestone which underlies the main phosphate bed is exposed, and the position of this lower phosphate bed curves, and is shown to the south of the Tennessee lode in various shallow pits or shafts. And I will state further that the position of the phosphate bed to the south of the Tennessee lode is shown by outcrops also of the underlying limestone within the boundary of the Tennessee lode itself. The lower phosphate bed is also shown in the tunnels 41 and 42, and at the discovery on the Tennessee lode.

Mr. JACK.—Within what placer would that be, Mr. Weeks?

(Testimony of Fred B. Weeks.)

A. That would be on the Waterloo. The next point where the phosphate bed extends without the boundaries of the lode claims is on the southeast end of the Mount Pleasant lode. This [581] is shown by several open cuts, which are marked on this black line—two cuts within the bounds of the Mount Pleasant lode and five cuts without the Mount Pleasant lode.

Q. I think you said the southeast instead of the northeast.

A. Yes; I should have said that this phosphate bed extends to the northeast of the Mount Pleasant lode, instead of the southeast. The outcrop of the bed is a curved line, as shown on Defendant's Exhibit 2, and bends around and takes a direction to the southwest, and the position of the bed is shown in three cuts above the northeast end of the Mount Pleasant lode. The lower phosphate bed is shown in tunnels 1 and 2 of the Obey lode. It extends up the hill to the point marked 70 ft. tunnel on the Wilmington placer, and is shown by either natural exposures or open cuts. From this point, the 70 ft. tunnel on the Wilmington placer, the bed changes. The outcrop of the bed changes its direction to approximately south, and is shown in several open cuts, some of which are noted on this Defendant's Exhibit 2, to a point on the ridge where the direction again changes and takes a northerly direction, the position of the bed being shown in various open cuts, and also at the tunnel marked B on the Wilmington placer.

Q. By way of a summary, on how many of the placer claims as shown on the Defendant's Exhibit 2

(Testimony of Fred B. Weeks.)

is the phosphate outcrop shown outside of the boundary lines of the lode claims?

A. It is shown outside of the boundary lines of the lode claims on the Wizard placer, the Winslow placer, the Winfield placer, the Colcock placer, and also the Wilmington placer.

Q. Calling your attention to this particular portion of [582] the bed—phosphate rock—the outcrop of which is shown by the black line, commencing on the south end of the Mount Pleasant lode, and extending around through the Wizard placer and into the Arkansas and back to the southeast corner of the Mount Pleasant, or near that corner, I will ask you to state whether or not that is the particular portion of the bed that is left—that has not been eroded away.

A. The portion within the inside of that black line is the phosphate bed that still remains.

Q. And in all other points below that down to the creek-bed; that is, all below the black line and on the Mount Pleasant lode, down to the creek line, is eroded away? A. Yes, sir.

Q. And is there any phosphate deposit at all on the Mount Pleasant lode claim other than the mere outcrop—lower outcrop of this bed, which has its dip from the Arkansas lode down to that point?

A. That is all.

Q. And below that—that is, the outcrop of the phosphate as it is shown by this line on the Mount Pleasant, is simply—is the lowest point on the Mount Pleasant lode at which phosphate occurs?

A. That is true. All of the area of the Mount

(Testimony of Fred B. Weeks.)

Pleasant lode lying to the west or northwest of the black line, the phosphate series has been entirely eroded, so that there is none there.

Q. And where on the dip does the phosphate series next appear in evidence, after this lowest point on the Mount Pleasant lode? [583] Where does it appear on the dip?

A. Well, it appears on the dip in the openings on the north end of the Wizard placer, and also upon the Arkansas lode.

Q. Yes; but I am asking about, having in mind the point where it outcrops on the Mount Pleasant, on the dip down the hill from the Arkansas, now still continuing on the dip of the bed where does it next—where is it next exposed below the Mount Pleasant lode?

A. It is shown on the Overton lode as a black line running through the Overton lode.

Q. That is the course of the creek?

A. On the west side of the creek.

Q. And all the phosphate series that were at one time within that creek-bed, together with the limestones on either side, have been eroded by that creek-bed? A. Yes, sir.

Mr. JACK.—Did I understand him to say that the Arkansas has the upper outcrop?

Mr. BUDGE.—Yes.

Mr. JACK.—And the Mount Pleasant has a lower outcrop of the same body?

WITNESS.—Yes, sir.

Judge DEY.—I guess that's true.

WITNESS.—Yes, sir.

(Testimony of Fred B. Weeks.)

Judge DEY.—If there is a double outcrop, I guess that's right.

Mr. BUDGE.—How's that?

Judge DEY.—I guess that's right. [584]

WITNESS.—You don't doubt it, do you?

Judge DEY.—No.

Q. The only direction that can be taken, then, following the deposit of phosphate rock on the Mount Pleasant, is upward toward the Arkansas?

A. Yes, sir.

Mr. BUDGE.—Now we offer at this time Defendant's Exhibit 2 in evidence.

Q. On the east side of the creek—Montpelier Creek—(which area on the east side embraces the Mount Pleasant, Arkansas, Hickman, and these other lode claims, and the Wizard and a portion of the Winslow placer)—well, you may call it the south side of the creek—the southerly side—wherever these lines—this line which you have drawn—shows the exposure of the phosphate, makes a curve to the west; it is simply where the land or the hills at that point are lower; and where the curves come up to the east the ground is higher? Is that it?

A. Yes, sir.

Q. And that wherever these curves to the east are shown, or angles are shown, it is where the phosphate bed has been eroded down to the point where the angle is made?

A. You mean to the west, instead of the east?

Q. I mean to the west.

A. Yes, sir; that's right.

Q. In other words, the bed as shown on this Ex-



(Testimony of Fred B. Weeks.)

hibit 2 is one into which inroads have been made by erosion, as shown by these different angles?

A. Yes, sir.

Q. Now, Mr. Weeks, what is the distance which this bed is [585] known to extend on its dip from the outcrop—the greatest distance which it is known, from the geological investigations made by the Geological Survey—in any of this area which has been examined by the Government?

A. In the winter of 1908 and 1909 a hearing was had in Washington, and Mr. George Otis Smith, the Director of the Geological Survey.—

Judge DEY.—You don't mean that, do you, Mr. Budge?

Mr. BUDGE.—No.

Q. I just want to know, Mr. Weeks, if you can tell us, from your study and reading and investigation of these deposits, what is known to be the extent of the deposit on its dip?

A. I was starting to give the authority for the statement that I was making.

Q. Well, just state what you know from your study of the subject. A. Eight miles.

Q. Eight miles? A. Yes, sir.

Q. And at what point was that?

A. It is stated to be at Rock Creek, a point five or six miles east of Sage, Wyoming.

(Another map, marked Defendant's Exhibit 3, was placed on the easel.)

Q. Calling your attention to Defendant's Exhibit 3, I will ask you if you prepared that map?

A. I did. [586]

(Testimony of Fred B. Weeks.)

Q. And what does it represent, Mr. Weeks?

A. It represents a section from the point marked "E," on the Waterloo placer, down to the point marked "F," on the Windward placer.

Q. Where is the Windward placer? In what direction is it? A. West.

Q. And what does the map show between those points?

A. The map shows the position of the lower phosphate bed as it extends from the natural outcrop at the point "E," through the upper tunnel and lower tunnel of the Waterloo, around and down to the bottom of a drill hole 150 feet in depth, which is located at the point "F."

Q. What was this drill hole, if you know?

A. I understand the discovery on the Inman placer, of phosphate.

Q. And is how far below the surface?

A. 150 feet.

Q. And what is the extent—that is, what distance is it from the outcrop to this point 150 feet in depth on the Windward?

A. I think it is 1065 feet. The scale of the map is one inch to 30 feet. I think that is the distance.

Q. Where is the Windward placer with reference to the Montpelier Creek channel?

A. It lies to the southeast.

Q. Of the creek channel? A. Yes, sir.

Q. Well, does it adjoin the creek channel? [587]

A. Well, it comes down pretty close to the creek at its lowest point.

Q. It is the lowest claim near the creek?

(Testimony of Fred B. Weeks.)

A. Yes, sir.

Mr. BUDGE.—We offer that in evidence, also, Judge—Defendant's Exhibit 3.

Q. Mr. Weeks, are you familiar as to the manner in which phosphate rock is used? A. Yes, sir.

Judge DEY.—We interpose an objection to the question covering all testimony of like nature, upon the ground that it is immaterial in establishing the question of the location of the ground under the lode or placer law.

Q. And to what extent have you had to do with the use of phosphate rock?

A. Well, I first began to use it when I was a boy on the farm, and sowing it on the ground, and so on, and have continued its use more or less down to the present time.

Q. In what parts of the United States have you used it personally?

A. Well, in my boyhood days I used it in the State of New York, and in 1898 I bought a farm fifteen miles west of Washington, Virginia, and owned that farm until March, 1909, and I used fertilizer to a very considerable extent every year on that farm.

Q. Phosphate rock? A. Yes, sir.

Q. What is the chemical contents of this rock?  
[588]

A. Calcium — calcium phosphate—calcium carbonate.

Q. And the chemicals of which it is constituted are calcium and phosphoric acid? A. Yes, sir.

Q. And is this deposit of calcium phosphate, phosphorite? A. No, sir.

(Testimony of Fred B. Weeks.)

Q. What is the difference between this and phosphorite?

A. Phosphorite is a variety of the mineral apatite. Its structure, as defined by mineralogists, is fibrous, or vitreous. It always contains some proportion of fluorine. It differs from the material in this rock in that there is no fluorine in this rock, and there is no material showing of a fibrous or radial structure; that this rock is an amorphous, uncrystallized material, formed entirely of these oolites and cementing material that I have previously described.

Q. Is phosphorite a crystalline deposit?

A. Yes, sir.

Q. Is phosphorite found in this country?

A. It has never been found up to the present time—it has never been reported.

Q. Where is it known to exist?

A. In Spain and France and Germany.

Q. What is this calcium phosphate mined for?

A. For its use as a fertilizer, to enrich the ground.

Q. And is that the only use to which it is put commercially at this time? A. Yes, sir.

Q. And for what constituents that it contains is it valuable? [589]

A. Calcium phosphate.

Q. Have you familiarized yourself with the manner in which this rock is treated for use?

A. Yes, sir.

Q. And in what manner have you investigated that subject?

A. I have gone right carefully through the factory where the rock from this Montpelier region is

(Testimony of Fred B. Weeks.)

treated, and have seen it in operation—the actual making of fertilizer from the rock.

Q. Explain the method of preparation.

A. As the rock comes into the mill it passes through an ordinary rock-crusher, which breaks up and crushes the rock into a fine condition. From this crusher it is raised by an elevator to a distance of 14 or 15 feet, I should say, above the crusher. It passes over a series of sieves, as they call them, and the material that is ground fine enough passes on, or passes through this sieve, and that that is too coarse is carried below into a roller process, where the material that was too coarse to pass through these sieves is ground into a fine condition, and this is raised by an elevator and passed over into a storage bin, and in that condition it is about like flour. Then there is a receptacle made for the rock, and by the side of it one for the sulphuric acid, and the man in charge there who is doing the work puts in a certain amount of phosphate rock and a certain amount of sulphuric acid, where they are mixed together, and they pass through into a bin, a large receptacle below, where they are allowed to remain for several hours, frequently overnight, and the material is then run through another [590] machine, which breaks it up. It has a tendency to stick together, some of the material does, in this receptacle, and so it is run through this machine to break it up in a separator, so that it is very fine; and from there it is carried out into a large storage shed, where it is stored in piles, and where it usually remains for several weeks before it is shipped.



(Testimony of Fred B. Weeks.)

Q. And in that state it is used for fertilizing purposes? A. Yes, sir.

Q. What proportion of calcium phosphate does this rock contain that is found in these beds on these properties—on these claims in question?

A. It averages about 70%.

Q. And is it mined or used for phosphorus, or for any phosphorus content in it?

A. No, sir; there never has been any phosphorus made from this rock that I know of.

Q. Is the calcium—the constituent of calcium that is found in this rock—of beneficial use as a fertilizer on the land? A. Yes, sir.

Q. And what effect does it have?

A. The effect of the calcium in the calcium phosphate is similar to that of ordinary lime, which we put lime upon the soil to sweeten it.

Q. What would be the effect of using the phosphoric acid that is within this deposit, if the calcium were extracted and the phosphoric acid alone was used?

A. Well, I don't think you could use it in that way. You [591] would have to have some material to carry your phosphoric acid, in order to put it upon the soil.

Q. If it could be carried, what would be the effect of it? Would it be beneficial or otherwise?

A. Well, I don't know. I think it would be entirely speculation to say what would be the result.

Q. How does the phosphoric acid act upon the land, as compared with the calcium that is in this

(Testimony of Fred B. Weeks.)

calcium phosphate, and how do the two act together as a fertilizer?

A. Well, the calcium—the combined calcium phosphate which is in the fertilizer, acts in two ways, one of which furnishes phosphoric acid for the use of the growing plant, and the calcium, which is the chemical combination, acts in sweetening the land, or in changing its mechanical condition so as to improve the quality of the soil.

Q. Is it essential that calcium be used in connection with this phosphoric acid in this deposit for fertilizing purposes? A. Yes, sir.

Q. Now, in the preparation of this rock, is there any sorting of it, or any part of it that is not used as fertilizer?

A. None at all; it is all used.

Q. And is there any part of it that is not beneficial to the land, when treated as you have described?

A. Well, it is such a small part that it is almost infinitesimal. There is a small amount of silica shown in various chemical analyses that would probably neither be beneficial nor otherwise to it; but it is exceedingly small. [592]

Q. But I am speaking of the calcium phosphate itself; is there any part of it that is not beneficial?

A. No, sir.

Q. And is this phosphate rock mined and used as a whole, then? A. Yes, sir.

Q. What have you to say with reference to the comparative value of the use of this phosphate rock as treated, or its use in the natural state?

(Testimony of Fred B. Weeks.)

Judge DEY.—It is understood that all this goes in subject to our objection?

Mr. BUDGE.—Oh, yes.

A. Well, I know from reading, and from observation and experiments of other parties, and from my own use of the raw rock and of the treated rock, that under proper conditions it is far better to use the raw rock than it is the treated rock.

Q. What are the conditions under which raw rock may be used with more beneficial results than the treated rock?

A. The raw phosphate rock should always be used upon soil that contains a large amount of humus, or one should add to the soil either manure or the plowing under of green crops, to start the fermentation that makes the humic acids which attack the fertilizer, the raw rock, and make the calcium phosphate valuable to the plant. If we take the raw rock and spread it upon a sterile soil from which the humus has been removed by one process or another, it is almost of no value at all. To improve the conditions which I have described, the raw rock is far better for use than the treated rock. [593]

Q. You spoke of the plant taking up the calcium phosphate. I will ask you whether or not the phosphoric acid is the only constituent which is used by the plant?

A. No, I don't think so. There is some lime that is used by practically all plants; and undoubtedly some of the lime or gypsum which is in the treated fertilizer would be used by the plant.

(Testimony of Fred B. Weeks.)

Q. For what purpose is gypsum used, Mr. Weeks; I mean for fertilizing purposes?

A. In the same way that we use lime for treating soil which is becoming very sour and will not yield paying crops.

Q. And what effect does the calcium in the calcium phosphate have? Does it have a different effect, or the same effect, or a similar effect to the gypsum or lime?

Q. My own experiments (if you may call them such) show that the calcium phosphate will sweeten the soil to a very considerable extent, and doubtless in the same way, the same chemical combinations taking place and the chemical conditions being made that occur with lime.

Q. What proportion of this calcium phosphate is calcium—what percentage, approximately?

A. I have forgotten exactly. Calcium carbonate runs up to something like 30%.

Q. 30%? A. Yes—calcium carbonate.

Q. In what states, Mr. Weeks, from your study of this question, have experiments been made as to the profitable use of this phosphate rock in its raw state, and covering what periods of time? [594]

A. Experiments have been made with the raw phosphate rock in Maine, Massachusetts, Rhode Island, Pennsylvania, Maryland, Ohio and Illinois. They are experiments of what are known as United States Experiment Stations, conducted under the Agricultural Department, and those experiments cover a period of from five years, as a minimum, in

(Testimony of Fred B. Weeks.)

Illinois, to 21 years as a maximum, in Massachusetts.

Q. And compared with the use of the rock in its treated state, what do those experiments show?

A. In the various publications which I have read describing those experiments, the summary or conclusion is that under proper conditions the raw phosphate rock is worth probably double what the treated rock is. The experiments in Maryland were conducted at the station at College Park, Maryland. I have been there for a good many times, in different seasons and different years, watching the results of those experiments, and it was as a result of those personal observations there in the field that I began the use of the raw rock upon my own farm.

Q. And in the conduct of these experiments I will ask you whether or not there is any sorting process, or whether the rock is used as a whole?

A. Well, so far as I know, there is no sorting process. The material as it comes out of the sack as you buy raw rock, looks just like raw ground phosphate rock.

(Witness temporarily excused.) [595]

[**Testimony of Thomas L. Glenn, for Defendant.**]

THOMAS L. GLENN, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. What is your name? A. Thomas L. Glenn.

Q. How old are you, Mr. Glenn? A. 64, past.



(Testimony of Thomas L. Glenn.)

Q. Where do you reside?

A. Montpelier, Idaho.

Q. What is your occupation?

A. Practicing attorney—attorney at law.

Q. Were you ever interested in any mining properties on what is known as Smith's Fork, in Wyoming? A. Yes, sir.

Q. What kind of properties were they?

A. Coal.

Q. And in what years were you interested in them?

A. 1897, 1898, and to a small extent for several years afterwards.

Q. In 1897? A. 1897.

Q. And to what extent were those coal properties worked—by you?

A. Well, we put in on a tunnel that had been started by another party there, we put in about 99 feet of tunnel work, beginning at a point about 80 feet under the earth. [596]

Q. And did you run more than one tunnel?

A. Yes, sir. Then we put in two other tunnels, one 58 and one 54 feet, and a shaft of 68 feet.

Q. And did you ever have any other experience in respect to coal mines or coal properties?

A. Well, with the exception—that is, I attempted to develop the lands now in controversy.

Q. What did you have to do with this deposit on Montpelier Creek, which is now known as the phosphate deposit?

A. In 1901 Mr. Brennan and I put in a tunnel on—I presume it is the north side, or the northwest

(Testimony of Thomas L. Glenn.)

side of Montpelier Creek, and on a line with the Waterloo claim; we put in a tunnel there about 250 feet deep.

Q. Well, from your investigations of this property before you commenced the working of it, what did you conclude as to the nature of this deposit?

Judge DEY.—Objected to, as the witness has not shown himself qualified to answer that question.

A. Well, we thought from the external appearance that it was coal, too; and with that view, or with that idea, we ran this tunnel.

Q. And did you make any filings upon this ground? A. Yes, sir.

Q. And what kind of filings?

A. We filed declaratory statements for coal.

Q. You afterwards sold out your interest?

A. I afterwards sold out to the agent of the San Francisco Chemical Company. [597]

Cross-examination.

(By Judge DEY.)

Q. What year was that, Mr. Glenn? A. Sir?

Q. What year was this?

A. That I sold out our claim there?

Q. Yes.

A. I think it was 1903, as well as I now remember.

Q. You thought from the appearance that you had a vein of coal there?

A. Yes, sir, there was every indication. I forgot to state that we also found what we considered a coal on Bear River, about—I should judge about four miles from Soda Springs. There was a cropping on

(Testimony of Thomas L. Glenn.)

the edge of the river, two horizontal veins, one about 18 inches thick, and one about eight feet thick, which we believed to be coal, and I still think so. That is, I think it is a coal cropping.

Mr. BUDGE.—That is some distance from this outcrop? A. Yes—about 30 miles.

Mr. BUDGE.—Well, I was just inquiring as to this property.

Q. Well, has that coal experience been your sole doings with this ground in controversy?

A. Yes, sir, with the exception of my observation as it has been developed.

Q. Let me refresh your recollection by asking you whether or not at some time you made lode locations called the Emerald, [598] the Ruby, the Topaz and the Opal lodes? A. No, sir.

Q. In Montpelier Canyon?

A. No, sir; we never entered any but declaratory statements for coal.

Q. Well, you named them, did you? A. Sir?

Q. You named them?

A. Why, I don't remember now. I don't think we did.

Q. No?

A. I think we located by the legal subdivisions.

Q. But I am asking you if you didn't make some lode locations down there?

A. No, sir; I never made one in my life—that is, if my name was ever used in one I don't know it.

Q. You would know that?

A. I think so, yes.

(Testimony of Fred B. Weeks.)

Judge DEY.—That's all.

An adjournment was thereupon taken until tomorrow morning at 9:30 o'clock A. M. [599]

On Thursday, the 22d day of June, 1911, at 9:30 o'clock A. M., the hearing was resumed, pursuant to adjournment.

**[Testimony of Fred. B. Weeks, for Defendant (Recalled).]**

FRED. B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. Of what metals or minerals, or both, is this deposit composed, Mr. Weeks?

A. Calcium—calcium phosphate—and a very small amount of iron and aluminum.

Q. Is the metal calcium in combination with the nonmetalliferous phosphoric acid? A. Yes, sir.

Q. Now, in what respect does that differ from the constituents of gypsum?

A. Gypsum is a chemical combination of calcium sulphate, the calcium being the metallic portion and sulphur the nonmetallic.

Q. And what have you to say as to limestone?

A. That is a calcium carbonate.

Q. The metal calcium in combination with—  
[600] A. —carbonic acid.

Q. And borax?

A. One form is a silicate of borax; the most com-

(Testimony of Fred B. Weeks.)

mon form is the mineral Colmanite, which is calcium borate.

Q. Which is the metal calcium with what?

A. Boric acid.

Q. And it is nonmetalliferous?

A. It is nonmetalliferous.

Q. And the salt?

A. The salt is sodium chlorine.

Q. That is the metal calcium with what?

A. With chlorine—nonmetalliferous.

Q. Have you used lime, or what is known chemically as calcium oxide, for fertilizing purposes?

A. Yes. To a certain extent the lime enters into the constitution of plants, in a very small amount. The principal object of using lime upon the soil is, as I stated before, to sweeten the soil—to change it from that sour condition. It also, besides this chemical effect, it has a mechanical effect upon the soil.

Q. And is this same result produced to a degree in the use of the calcium phosphate?

A. Well, not to the same extent that the calcium carbonate does, or the calcium oxide; but in my opinion, from the results I have seen of my own use, the calcium phosphate does to a considerable extent have the same effect as the calcium oxide.

Q. And is that by reason of the existence in the fertilizer of the calcium in combination with the phosphoric acid? [601] A. Yes, sir.

Q. Are you familiar with limestone deposits, Mr. Weeks? A. Yes, sir.

Q. And with limestone deposits that are worked



(Testimony of Fred B. Weeks.)

for commerical purposes? A. Yes, sir.

Q. Where? A. In New York and Maryland.

Q. Any Western States?

A. In Utah and Nevada and Wyoming.

Q. What is the manner of the occurrence of these limestone deposits?

A. They occur as bedded, sedimentary deposits, being a part of the sedimentary series of the country in which they occur.

Q. Have they a dip—those deposits?

A. They have.

Q. And a strike? A. Yes, sir.

Q. Have they overlying beds and underlying beds?

A. Yes, sir.

Q. And are they similar in that respect, or dissimilar, to the deposits of calcium phosphate on the claims in question, as to the manner of occurrence and their position in the earth?

A. They very closely resemble these deposits—the phosphate of lime—in all of those respects.

Q. What have you to say as to the cement deposits, or the constituent that is used for the manufacture of cement? Are you familiar with those deposits?

[602]

A. Yes, sir, in several places.

Q. In what sections of the country?—where?

A. In New York and in Utah. I don't recall any others at this moment.

Q. And how do they occur, as compared with the phosphate deposits?

A. They occur in stratified, sedimentary rocks,

(Testimony of Fred B. Weeks.)

with dip and strike similar to the phosphate deposits.

Q. And as to gypsum; are you familiar with those deposits?     A. Yes, sir.

Q. In what portions of the country?

A. Principally in New York and in Utah.

Q. And how do they occur?

A. They occur as a part of the stratified series, with dip and strike, like the phosphate beds.

Q. Have a floor and a roof?     A. Yes, sir.

Q. And, as you say,—did you say sedimentary?

A. Yes, sir.

Q. How does salt occur?

A. Salt occurs both as the deposit from a solution in water, and also in stratified sedimentary beds.

Q. And as to those stratified sedimentary beds; have they a floor and roof, a dip and a strike?

A. Yes, sir.

Q. Calling your attention to coal deposits, are you familiar with coal deposits? [603]     A. Yes, sir.

Q. In what sections of the country?

A. Wyoming, Utah, and a small deposit of coal in Southwestern Nevada.

Q. And how does coal occur, as compared with this deposit?

A. It occurs as a part of a stratified sedimentary series, having a dip and a strike similar to the phosphate beds.

Q. How does it compare with the extent of the deposit on the dip?     A. They are very similar.

Q. Extensive?     A. Very extensive.

Q. I think you stated on yesterday that it had been

(Testimony of Fred B. Weeks.)

determined that this phosphate rock extended on a dip in one place here for a distance of about eight miles. From your study of the topography of the country where these deposits occur that are in question in this suit, what would you say as to the probable extent of the deposit; that is, the deposit which has its dip westerly on the east side of Montpelier?

A. I consider that from the exposures of the phosphate series in Montpelier Canyon, they extend to the west to underneath Bear River Valley, and appear again (the same series) upon the surface in what is known as the Bear River Mountains, near Paris—west of Paris.

Q. When you say “Bear River Valley,” you mean the Bear Lake Valley?

A. The Bear Lake Valley, yes, sir. And in fact these deposits extend both on the dip and strike, much farther than [604] what I have just stated. It is really a bed—a layer—that extends for several hundred miles in each direction; that here and there it has been brought to the surface by the internal forces which have folded rocks, and that those are the points where we now see it. Nevertheless, it extends as a bed completely underneath the territory where it does not actually come to the surface.

Q. Now, what is the approximate area—that is, the length and breadth of the area—which is underlaid by this stratum of phosphate rock, and describe from what points it extends. That is, describe the northerly and southerly ends of the area, and the sides, approximately.

(Testimony of Fred B. Weeks.)

A. I have found the phosphate bed occupying the same geological position that is occupied by the Montpelier beds, in the mountain ranges near Cobre and Montello, Nevada. That is the farthest point to the west of which I know it. To the east I know it in the vicinity of Salt Lake. It then extends north, through the area shown on Defendant's Exhibit 1, and still farther north of this area to a point in Western Montana, some 40 or 50 miles south and west of Butte, Montana. That represents its extension north and south; and to the east, beyond the limits of Defendant's Exhibit 1, I have found it in the several places that I described yesterday, through Wyoming, as far east as the Rocky Mountains north of Cheyenne. In all these areas where the phosphate beds come to the surface we find that it is associated with—that is, it has above and below it strata containing the same fossils that we find upon the Montpelier deposits, forming the top and bottom of the phosphate series at Montpelier. [605]

Q. The same stratification? A. Yes, sir.

Q. Now, what is the distance—the length of this area, rather,—and the width of it—approximately?

A. The width of it east and west is approximately 500 miles, and north and south 300 miles.

Q. What is the conclusion, or the accepted idea of geologists who have treated of the manner of formation of this deposit, as to how it came to be formed, or the manner in which it was formed?

Judge DEY.—Objected to as incompetent, as asked.

(Testimony of Fred B. Weeks.)

Q. I mean throughout the entire area.

A. It was deposited upon the bed of an ocean, in comparatively shallow water, grain upon grain, until the whole phosphate series has been laid down upon the limestone strata which forms the base of the phosphate series.

Q. And then overlaid by the—

A. —then overlaid by younger rocks—younger strata—formed in the same way.

Q. Now, how are placers formed, Mr. Weeks?

A. Placers may be formed by the breaking up of the rock strata into small particles, and moved by water to lower positions, and concentrating there in gulches, where they are found, forming such gulch placers.

Q. Are such deposits as you have described sedimentary? I mean sedimentary in the sense that they are deposited in the position in which they are found by the action of water. [606]

A. In that sense they are.

Q. And in what other manner are placers formed?

A. Placers may be formed along the sea beach. For instance, we have in Oregon at the present day a formation of placers as sea beach deposits, and those are not worked for their gold contents. And the same is true with various placer deposits in Alaska, and they are known in other places throughout the world. It is not only known that they are formed now, and are forming now, but that they have been formed in previous geological ages. We find in the strata, beds which were formed, which were



(Testimony of Fred B. Weeks.)

originally placers and formed in the same way that placers are formed to-day, now lying covered by hundreds of feet of stratified rocks.

Q. And underlaid by such rock?

A. Underlaid by other stratified rocks.

Q. And are these overlying and underlying rocks, solid?     A. Yes, sir.

Q. Where are such placers found, Mr. Weeks?

A. We have such placers in California, except that the covering of the placer is an eruptive rock and not a sedimentary rock; the placers themselves are covered by a mass of eruptive rock, forming the roof you may say of the placer. Such deposits are known in other countries; for instance, in Australia.

Q. Now, Mr. Weeks, describe how veins are formed.

A. One of the most common forms of veins are those which occupy fissures, or cracks, or crevices, that have been previously made by the contraction of the earth's surface, or by the irruption of igneous materials into the rock masses or [607] strata, and thus making these fissures. Another form of vein deposit is that in which the mineral-bearing solutions dissolve out a portion of the rock masses, which solutions are penetrating, and leave in their place minerals or other matter which are precipitated.

Q. How does the mineral deposit or ore deposit come into place in the crevice in which it is found in a vein?

A. These fissures and cracks form the passages by which the water or mineral bearing solutions pass

(Testimony of Fred B. Weeks.)

through the rocks, and in passing through them a portion of the minerals which are in solution are deposited along the sides of these cracks and crevices, often extending out into the rocks which are close to these cracks and crevices, and in them a portion of their burden of mineral matter is deposited.

Q. Is this forcing of the mineral solutions in these cracks and crevices due to the action of heat?

A. There is no doubt but what heat is one of the attendant phenomena; but the immense pressure under which everything within the crust of the earth at considerable depth exists, is probably the main cause for the forcing of these mineral solutions through the rock strata in the crust of the earth.

Q. What do you understand by "gangue"?

A. A vein or a lode deposit is formed of a substance which contains metallic ores and other materials, and whatever material is in a vein that is not a metallic ore constituent we call the gangue of a vein.

Q. Does it come in with the ore in solution into the crack and crevice, as a part of the solution?  
[608]

A. In most cases it does.

Q. What have you to say, Mr. Weeks, as to whether or not veins or lodes—in veins or lodes—as to whether or not the ore deposit conforms to the stratification in which it occurs, or in which it is found?

A. I don't know of an instance, nor I have never read of an instance, in which the ore of a vein or lode conforms to the stratification of the beds which are upon either side of the vein or lode, or form a

(Testimony of Fred B. Weeks.)

part of the vein or lode.

Q. Well, how do veins or lodes occur with reference to the stratification?

A. They usually occur cutting across the stratified beds at various angles. They may also occur as a replacement of a sedimentary bed itself, but they don't follow the stratification of that bed; simply the vein or lode in that case is formed by the ore-bearing solutions removing particles of the sedimentary bed, leaving in its place the metallic ores which we now find in such a vein or lode. But in the formation of a vein or lode of that character the vein matter and the metallic substances do not follow the stratification of the bed itself.

Q. What have you to say as to the regularity or irregularity of the vein deposit, or the deposit in what is known as a vein? By that I mean its regularity as to width and extent; and also describe the condition with reference to veins as to the quality of the deposit.

A. In reference to the extent of a vein, in width it will vary from practically nothing up to many feet, in width, and it varies from point to point along the vein or lode with reference [609] to such thickness. So that a vein which would average three feet in width might in some places measure only six inches in width, or even less. So that when we speak of the thickness or width of a vein or lode we always carry in mind the idea that it is a varying quantity. The same statement is true with reference to the quality of a vein or lode; the amount of metallic min-

(Testimony of Fred B. Weeks.)

erals which are deposited in the vein or lode varies from point to point. There may be large parts of a vein or lode which contain so small an amount of the metallic minerals that it cannot be worked or treated commercially. There are other places, in what we call ore chutes, in which ores are concentrated, and the value of the material is very high. These ore chutes may extend for many feet along a vein, or they may be of a very small amount. So that as to the quality or quantity of the valuable material in a vein it varies very greatly.

Q. Is the deposit which is found in a vein older or younger than the surrounding rock, commonly called the country rock? A. It is always younger.

Q. Are veins, as the term is commonly understood in mining and geology— Well, I will ask you to describe the position of veins or lodes, whether they are horizontal or vertical; or how do they occur?

A. A vein may occupy any position from the horizontal to the vertical.

Q. What have you to say, Mr. Weeks, as to the age of veins? Is there any age under which veins are classed?

A. Oh, no; you will find veins or lodes in rocks of all ages. [610]

Q. They belong to no particular age, then?

A. No, sir. The fact is that veins often penetrate through stratified rocks of different ages; that is, beginning in rocks of one age and cutting through into rocks of another age.

Q. In what class of rocks are veins usually found?



(Testimony of Fred B. Weeks.)

Judge DEY.—We object to that as wholly irrelevant and immaterial to any issue in this case.

A. I think the larger number of veins are usually associated with igneous rocks; although, of course, many are often found in sedimentary rocks.

Q. Calling your attention, Mr. Weeks, to this phosphate deposit, and bearing in mind the description which you have given as to veins which are formed by dissolution of some sedimentary deposit and the replacement of it by the vein deposit; I will ask you whether in this deposit there has been a process of replacement; and if not, state the reasons why you come to that conclusion.

A. I have never seen any evidence of the replacement of a bed existing prior to this phosphate bed and the phosphate material replacing any of it. There is no evidence—no indication at any of the many points that I have examined this phosphate bed, of a replacement process. It is always the case that where rock strata are replaced by other materials, that some portions of those rock strata are left behind, in which the replacement process has not taken place. So that in a bed of limestone where a large—or where parts of the calcium carbonate [611] had been removed, there are always yet large portions of limestone remaining; so that in—

Q. Just a moment. Is that true, Mr. Weeks, as to all veins which are formed by a process of replacement? A. Yes, sir.

Q. Do you know of any exception?

A. No, sir. In this bed of phosphate we find no



(Testimony of Fred B. Weeks.)

particles of limestone or particles of other substances that might have been, some parts of them, replaced. The bed itself is everywhere composed of these grains, or oolites, and the material which cements them together, and we never find anything else in it.

Q. With reference to this deposit of phosphate rock, is there any fissure, as the term is understood in mining and geology?

A. No, sir, I have never seen one.

Q. And how does this bed occur with reference to the uniformity of its quality and thickness, as compared with veins or lodes?

A. The lower phosphate bed upon the Montpelier deposits, and on the extension of the same bed north and south, is very regular, both as to its thickness and as to its quality; and the same may be said for phosphate beds in other localities; that wherever they are exposed they show a remarkable uniformity in the regularity of their thickness and the evenness of the quality of the material.

Q. And as to their conformity to the stratification, in what respect do they differ from veins or lodes?  
[612]

A. They differ from veins or lodes in that veins or lodes do not conform to the stratification of the country rock, and in this case of the phosphate series they conform absolutely with the lay of the country, and with the strike and dip of the underlying and overlying rocks; and they are also remarkable from the fact that in their deposition the line of demarcation between the upper and lower limits is strongly

(Testimony of Fred B. Weeks.)

marked, and the limestone which caps the lower phosphate bed within the Montpelier deposits is fractured by joint planes, and there is along these joint planes no deposition of any phosphatic or other material, which is the case in vein or lode deposits; that where the enclosing rock of a vein or lode contains joint planes similar to these, ore-bearing solutions go out into these joint planes and deposit more or less of the material. In this case of the Montpelier deposits, and other parts of the phosphate area, we have never seen any indication of the deposition of phosphatic material along these joint planes.

Q. What have you to say as to the age of this phosphate rock—the age in which it was formed?

A. It was laid down in the carboniferous—the upper carboniferous age.

Q. What do you mean by that age?

A. That is one of the divisions into which geologists have divided the sedimentary strata which form the earth's surface, beginning with the Cambrian, then the Ordovician, the Silurian, the Devonian, and then the Carboniferous.

(At the request of Mr. Budge, photograph was marked Defendant's Exhibit 4.) [613]

Q. Calling your attention to Defendant's Exhibit 4, Mr. Weeks, did you take that photograph?

A. Yes, sir.

Q. And what does it represent?

A. It represents the tunnel and the exposure of the phosphate—the lower phosphate bed along the side of the tunnel, and the overlying limestones, phosphates and shales, at the point on the Waterloo

(Testimony of Fred B. Weeks.)

placer marked Tunnel O.

Mr. BUDGE.—We offer this also, Judge.

(Submitting the same to Judge Dey.) Defendant's Exhibit 4 is offered.

Q. Calling your attention to the stratification as you have it indicated upon Defendant's Exhibit 4, you have first the Basal limestone; then the main phosphate bed; and then a bed of limestone. Now, with reference to this bed of limestone last mentioned, and which appears upon this photograph as the lightest in color of any of this strata, is that the deposit to which you referred when you stated that it had some seams or cracks wherein none of the phosphate rock could be found, or the phosphatic material?

A. Yes, sir, that is the bed, and those joint planes may be seen in that photograph extending entirely through that two-foot bed of limestone.

Q. Is this calcium phosphate deposit an ore deposit, Mr. Weeks?     A. No, sir.

Q. What is ore?

A. It is the metallic contents of a vein or lode, which [614] is in sufficient amount and in such combination that it can be economically extracted.

Q. With what other materials—mineral deposits—is phosphate classified by geologists?

A. As a nonmetallic substance, as classified with gypsum, borax and salt, and other materials of that general character.

Q. Is Heinrich Ries a recognized authority on geology?

(Testimony of Fred B. Weeks.)

A. Yes, sir; he is the Professor of Geology at Cornell University.

Q. And is his work on Economic Geology an authority? A. Yes, sir.

Q. And in this work how is it classified?

A. As I have stated—not as an ore deposit.

Q. But with what?

A. With gypsum and borax and salt, and materials of that kind.

Q. Recurring, now, Mr. Weeks, to the Defendant's Exhibit 2, and as to the manner in which the lode locations have been made upon this phosphate deposit; how do these lode locations conform, or do they conform, to the strike of the deposit?

A. The only lode location which conforms to the strike of the deposit, or of the phosphate series, is the Hickman lode, and that only in part.

Judge DEY.—What lode is that?

WITNESS.—The Hickman.

A. The part of the Hickman lode which extends to the southwest is not upon the strike of the bed.

Q. What is the strike of this bed?

A. The strike of the bed is essentially north and south. [615] It varies very slightly from that, as the dip of the bed varies slightly from directly west.

Q. How have these lode locations been made, then, with reference to the strike?

A. They have been made at varying angles with the strike, the lode locations following pretty closely the outcrop of the lower phosphate bed, but do not conform to the strike of the bed.

Q. Calling your attention particularly to the Over-



(Testimony of Fred B. Weeks.)

ton and Mount Pleasant lodes, and also to the Cumberland: how are they laid out with reference to the strike?

A. They are laid at an angle with the strike, the strike being north and south and these lodes have a northeast-southwest direction. They are at an angle both with the strike and dip.

Q. And as to the other claims—lode claims—how are they laid out with reference to the dip?

A. The Hickman and the Arkansas lodes in part are laid along the strike of the bed. The Tennessee lode follows the dip of the bed. The Mount Pleasant, the Overton and the Cumberland are laid out at an angle with the dip of the bed, the dip being to the west in those cases. In the Jimtown and Fentress, Obed and Obey lodes, they are at an angle with the dip of the bed; so that the direction of these lodes does not conform either with the strike or with the dip.

Q. What is the dip of this deposit?

A. It varies from  $12^{\circ}$  to  $35^{\circ}$ .

Q. I mean in what direction? A. To the west.

Q. Always? [616] A. Yes, sir.

Q. Calling your attention now to the Plaintiff's Exhibits "A" and "B," which represent the Frances placer mining claim and the Freyerson lode mining claim, and the Raymond placer and the Japan and China mining lode claims; have you examined those claims? A. I have.

Q. And on how many occasions, Mr. Weeks?

A. My first examination was in 1906. I was there again in 1907 and in 1909 and in 1911.



(Testimony of Fred B. Weeks.)

Q. Is that the same deposit or a similar deposit to the deposit back of Montpelier?

A. It occupies the same geological horizon.

Q. And is it the same material?

A. Exactly similar material.

Q. Calcium phosphate? A. Calcium phosphate.

Q. What is the position of the bed of phosphate upon those claims?

A. It is dipping steeply to the east.

Q. In all of them?

A. At the tunnel near the discovery point on the north end of the China lode claim, the beds there are shown dipping to the west. At all other points where the beds are exposed, either naturally or in tunnels, the beds are dipping at a steep angle to the east.

Q. Do you find upon the same lode claim, or within the boundaries of the same lode claim, different dips, or dips in different directions? [617]

A. It is slightly different. The dip in all cases is very steep.

Q. And upon what claim is the dip in both directions?

A. Well, I will amend that by stating that there is no evidence that upon one—in one lode claim there is a change in dip from one direction to the other; but on the south end of the Japan lode in those tunnels the beds are dipping steeply to the east, while at the north end of the China lode they are dipping to the west.

Q. Mr. Weeks, are you familiar with the deposits which have been located upon by the Utah Fertilizer

(Testimony of Fred B. Weeks.)

Company? A. Yes, sir.

Q. Where are they situated?

A. In Georgetown Canyon, east of Georgetown, Idaho.

Q. And what is the nature of that deposit?

A. That is a deposit of calcium phosphate, similar to that at Montpelier, having the same associated strata above and below the phosphate series in Georgetown Canyon that there is in the Montpelier Canyon.

Q. What form of locations have been made upon these deposits near Georgetown, Mr. Weeks?

Judge DEY.—Objected to as wholly immaterial and incompetent, in any sense.

A. Placer locations, and later lode locations have been placed on some of them.

Q. The placer locations, are they the locations of the Utah Fertilizer & Chemical Manufacturing Company? A. Yes, sir. [618]

Q. Are you familiar with what is known as the Hillside group of placer mining claims?

A. Yes, sir.

Q. In sections 24, 25 and 26, township 10 south, range 44 east? A. I think that's right.

Judge DEY.—What State is that in?

Mr. BUDGE.—Idaho.

Q. And that is how far north of these deposits in Montpelier—near Montpelier?

A. About 10 or 12 miles in a direct line.

Q. Calling your attention to this map which appears as a part of Bulletin 430H, U. S. Geological Survey, Plate 5, page 28, I will ask you what that

(Testimony of Fred B. Weeks.)

map represents, Mr. Weeks?

A. The map represents the areal distribution upon the surface of the phosphate series and of the beds which underlie and overlie them, and there are also three cross-sections which show the stratigraphy and structure of the areal maps.

Q. And from your personal examination of this area, are you able to state whether or not this is a correct representation of the conditions there?

A. Yes, sir; I have made a careful study of it; I know that that is correct.

Mr. BUDGE.—(To Judge DEY.) Judge, I desire to introduce that map for the purposes of illustration, and it will not be necessary to introduce the whole bulletin, but I would like to take it out and introduce the map itself.

Judge DEY.—Well, just offer it, and leave [619] any objection pending until my cross-examination.

Mr. BUDGE.—Yes.

Judge DEY.—All right.

Mr. BUDGE.—I will have it marked Defendant's Exhibit 5.

(Said plate or map was so marked.)

Q. Are there any places upon these claims which are in question where the stratification is similar to the stratification as it appears upon this map, Defendant's Exhibit 5?

A. The stratification is the same, but the structure or the folding of it is not the same.

Q. In what respect does it differ?

A. The beds at Montpelier have a dip to the west in every place where they are exposed, while in

(Testimony of Fred B. Weeks.)

Georgetown Canyon the beds in some places dip to the west and in some places to the east; so that there is a fold of the strata which is termed as incline. On one side of this fold the beds dip to the west, and on the other side the beds dip to the east. That is the explanation of the sections which are shown on the side of the map—of the Exhibit 5.

Q. Are you familiar, Mr. Weeks, with what is known as the Highland placer mining claim?

A. Yes, sir.

Q. On the Utah Fertilizing and Chemical Manufacturing Company, near Georgetown?

A. Yes, sir.

Mr. BUDGE.—We will have these marked, also.

(Said documents were thereupon marked Defendant's Exhibits 6 and 7, respectively.) [620]

Mr. BUDGE.—We offer these in evidence, Judge.

Judge DEY.—What are they?

Mr. BUDGE.—They are final certificates of entry for placer mining claims, issued to the Utah Fertilizer & Chemical Manufacturing Company, for placer claims upon these deposits.

Judge DEY.—To those papers marked for identification Defendant's Exhibits 6 and 7 we object as immaterial and incompetent, having no bearing upon any issue in this case, or bearing in any manner upon whether the ground in question is locateable as a lode or as a placer.

Q. Are you familiar with the placer claim of the San Francisco Chemical Company known as the Layland?

A. Yes, sir.

(Testimony of Fred B. Weeks.)

Q. Where is it with reference to the Raymond placer?

A. It lays to the north some two or three miles.

Q. And where is it with reference to the Frances?

A. It is north of the Frances.

Q. Also? A. Yes, sir.

Q. Is it upon that same deposit? A. Yes, sir.

Q. Have you examined that claim?

A. Yes, sir.

Q. And it is a calcium phosphate deposit?

A. It is. [621]

Mr. BUDGE.—Now, I will say that the offer of Defendant's Exhibit 6 will be for the Idaho case, and Defendant's Exhibit 7 for the Wyoming case.

Judge DEY.—How about 5?

Mr. BUDGE.—5 is the photograph, and I will ask now—

Judge DEY.—No—5, as I got it, is that plate from page—

Mr. BUDGE.—Well, I'll tell you, we will have a duplicate— I was going to say that there are some of these exhibits which I shall ask leave to supply, and I will have exact copies of all of them put in with the Wyoming cases.

(At the request of Mr. Budge certain certified copies of certificates of entry were marked as Defendant's Exhibits 8 and 9.)

Mr. BUDGE.—Now, in the Idaho case we offer Defendant's Exhibit 8, and in the Wyoming cases Defendant's Exhibit 9.

Judge DEY.—What are those?



(Testimony of Fred B. Weeks.)

Mr. BUDGE.—They are certified copies of the final certificates of entry for the Layland claim.

Judge DEY.—They are all subject to the same objection.

Mr. BUDGE.—I will ask, will you agree that I may supply these other exhibits—copies of [622] Defendant's Exhibits 1 and 2 and—

Judge DEY.—Why, I agree that the Examiner may make these out in duplicate for the respective cases, attaching either the original or a correct copy to it.

Mr. BUDGE.—Yes. I was going to say that we would prepare them and submit them to the Examiner, or to you.

Judge DEY.—Oh, if they are copies, I don't care.

Mr. BUDGE.—Yes, that's all. That will be of Defendant's Exhibits 1, 2, 3, 4 and 5, to be attached to the record in the cases pending in the United States Circuit Court for the District of Wyoming.

Q. Mr. Weeks, do you know of any vein deposit which contains fauna? A. No, sir.

Q. In that respect, in what manner does this deposit differ from a vein deposit? In what respect does this phosphate deposit differ from a vein deposit?

A. In a vein or lode deposit fossils have never been found within the bounds of the vein or lode. The rocks on either side of a vein or lode, if sedimentary, may be fossiliferous. In the phosphate series the beds which are above and below the series are fossiliferous; and the beds of phosphate and

(Testimony of Fred B. Weeks.)

limestone and shale which comprise the phosphate series are each and every one of them fossiliferous. So that the whole [623] or any part of the phosphate series may be said to be fossiliferous, containing many fossilized shells; while we never find such an occurrence in a vein or lode.

Q. Have you had a microscopic plate or plates made of this phosphate material?

A. Yes, sir; I have had a great many thin sections—of what we call thin sections of the phosphate rock, made. That is, the rock—a piece of the rock is ground upon a stone until it is very thin—very thin. That is cemented upon glass, so that with the microscope you see directly through it, and it shows the internal structure of the minerals or other matter which is in the rock which has been ground to this condition and placed upon the glass. Then this thin section of the rock material is photographed by the use of a microscope, so as to enlarge the minerals or other matter upon the thin section, and those microphotographs (as they are called) are an enlargement of the thin section, and which is itself a part of the rock from which we started to grind the specimen.

Q. Have you any of those photographs with you, Mr. Weeks?     A. Yes, sir.

Q. Produce them, please.

(The witness produced two of such microphotographs, and the same were marked for identification as Defendant's Exhibits 10 and 11.)

Q. Calling your attention to Defendant's Exhibits

(Testimony of Fred B. Weeks.)

10 and 11, I will ask you what that photograph represents?

A. No. 10 is a photograph of a thin section of a specimen of the phosphate rock which I collected on one of the tunnels [624] of the Tennessee lode claim, shown on Defendant's Exhibit 2. Defendant's Exhibit 11 is a microphotograph of a thin section of a specimen of the phosphate rock which I collected upon the Cumberland lode, shown on Defendant's Exhibit 2.

Q. What are these dark, oval-shaped spots?

A. Those are the oolites, or grains.

Q. Which you have described heretofore?

A. Which I have described.

Judge DEY.—Did you take these?

WITNESS.—I didn't take those photographs.

Judge DEY.—Objected to, as the proper foundation has not been laid.

Q. Were they taken under your supervision, Mr. Weeks?

A. I collected the material, as I have stated, and the grinding into the thin section was done in part by myself and in part by Mr. Waring, of the Stanford University, and it was done in this way; that I took the specimen and ground it down to a uniform thickness, and then passed the specimen on to Mr. Waring to complete the grinding of it to the thin section. It is difficult to make, and requires a person skillful in it; so that I had to use the services of Mr. Waring to bring them to that condition. But they were made one at a time, and returned to me, and

(Testimony of Fred B. Weeks.)

I marked them with a mark of my own, so that I knew that the thin section was the thin section of the specimen collected at a particular place. These microphotographs were made by Mr. Waring himself, but I placed the thin section which I had marked under the microscope and examined them with the microphotograph in under, to determine that the microphotograph [625] that I had in my hand was a reproduction of the thin section which I had under the microscope; and I can state positively that those Exhibits 10 and 11 are microphotographs of the thin sections which were made in this way from material collected at the points stated upon Defendant's Exhibit 2.

Mr. BUDGE.—We offer these—the Defendant's Exhibit 10 in the Idaho case, and Defendant's Exhibit 11 in the Wyoming cases.

Judge DEY.—We renew the objection.

Q. Mr. Weeks, how does this compare—how does this phosphate rock compare, so far as its oolitic structure is concerned, with limestone deposits?

A. There are very many beds of limestone which are formed of oolites in the same way that I have described the formation of these oolites, and they show in thin sections the same structure as the oolites of the phosphate beds. The oolites of the limestones are calcium carbonate; and the oolites of the phosphate bed are calcium phosphate.

Q. Now, Mr. Weeks, as a result of your examination of the properties in dispute in these claims, placer and lode, as well as your examination of and

(Testimony of Fred B. Weeks.)

experience with this phosphate rock in the Western field, and the result of your experience and training in mining and geology; I will ask you whether or not this phosphate rock is a vein or lode of valuable deposits?

A. It is not a vein or lode, in any sense of the term.

Q. Is this phosphate vein or lode a quartz or other rock in place? A. No, sir. [626]

Q. In short, is this a vein or lode at all?

A. No, it is not.

Q. Is this phosphate rock in place?

A. Why, it is in place in the same sense that the limestones above and below it are in place—the same as any rock mass is in place.

Q. That is, as constituting a part of the mass of the mountain? A. Yes, sir.

Q. Now, does this phosphate rock bear a valuable mineral or ore? That is to say, is it mined for any mineral or ore that it contains; or is it mined and used for itself, as a whole?

A. It is not mined for any constituent part of the rock at all. The rock as a whole is mined and used, or the stratum or bed of the phosphate is used as a whole.

Q. Mr. Weeks, I wish you would just describe briefly—very briefly—if you are able to, from your studies as a geologist, what is known as the Witwaters rand mine in Africa?

A. The Witwaters rand contains many mines which are located on a deposit of conglomerate rock;



(Testimony of Fred B. Weeks.)

that is, something similar to gravel. After the deposit of this conglomerate it was raised above the ocean bottom, and there were intruded beneath it and into it a large amount of igneous materials.

Q. In solution?

A. No, not in solution, but as a plastic mass of igneous material. This conglomerate deposit is valuable for its gold. This gold is not contained in the conglomerate rock or pebbles, [627] but in the cementing material which binds these pebbles together. There is no evidence that the gold contents were deposited at the time of the formation of the consolidation of the conglomerate bed itself, but that it received its valuable contents of gold from the mineral-bearing solutions which penetrated the conglomerate rock, along with the irruptive material which was injected into it. So that we have in that case a typical vein or lode formation.

Q. How is asphaltum or gypsum formed?

A. They are both formed as sedimentary deposits.

Q. And do they ever come into place in the manner in which a vein deposit comes into place?

A. Some forms of asphaltum are found to occur as true fissure veins; that is, as filling a fissure.

Q. Calling your attention to Gilsonite, is that one of them? A. Yes, sir.

Q. And how does it come into the fissure—in solution or otherwise?

A. It probably came in as a loose—as a plastic mass, and subsequently hardened, and filling the fissure with the hardened material. Originally, when it was injected or forced into the fissure, it

(Testimony of Fred B. Weeks.)

must have been in a plastic condition, at least.

Q. Yes—is it a crystalline deposit?

A. No; it is an amorphous deposit—uncrystalline.

Cross-examination.

(By Judge DEY.) [623]

Q. Mr. Weeks, how much experience have you had in making plats?

A. Why, I have made them at various times for the last twenty years. I have never made a very great many of them, because I am not a very good draughtsman; but I have made quite a good many.

Q. Well, where has your experience been?

A. As a member of the Geological Survey, in making plats and diagrams to represent work that I had done.

Q. In rough?

A. Usually so, because on the Survey we employ draughtsmen for the purpose of doing the work for us. We furnish the rough draft, or the data from which to make them.

Q. And you have never occupied that position of draughtsman? A. No, sir.

Q. Or claim that you are a draughtsman?

A. Well, I claim that I can do as accurate work as any draughtsman; but it may not look as nice. That is the only difference.

Q. Now, if you will step up here to this easel to Defendant's Exhibit 2. Did you place that black line on there merely to represent in a general way, or to accurately represent?

(Testimony of Fred B. Weeks.)

A. It accurately represents what is stated on the legend on Defendant's Exhibit 2.

Q. In other words, you were able to trace upon the surface this lower bed of phosphate?

A. Yes, sir. [629]

Q. And you made a survey, of course, to determine the exact course which is platted?

A. Yes, sir.

Q. Who assisted you in that survey?

A. Mr. Bell and I worked together one day, and the principal part of the work I did by myself, with the blue-print in hand of Plaintiff's Exhibit 1, and a compass with which to take directions and dips of the strata. I followed this outcrop of the main lower phosphate bed, and platted upon this blue-print from point to point as I went along the positions.

Q. You kept your notes? A. Yes, sir.

Q. And you have those? A. Yes, sir.

Q. Calling your attention to the gulch southeast of—running southeast of Montpelier Creek: that gulch cuts through the Mount Pleasant lode?

A. Yes, sir.

Q. I notice that the curvature of the line—of the heavy line on Exhibit 2, at the places crossing the gulch, is in opposite directions? A. Yes, sir.

Q. How do you account for that?

A. By the dip of the strata and the slope of the surface, and they are also seen in position by open cuts in the bed itself at those points.

Q. Then, you mean to say that at this gulch, in

(Testimony of Fred B. Weeks.)

one instance the line crossing the gulch is curved in one direction, [630] and the other line in the opposite direction; is that correct? A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. Now, tell us again how you figure that out.

A. Why, the position of the bed, as shown in open cuts in the gulch itself, and on the dip of the bed and the slope of the hill.

Q. Why did you not place on this Defendant's Exhibit 2 the upper bed of the phosphate series, or the overhanging limestone—cherty limestone—Mr. Weeks?

A. There are great parts of that area in which that cherty limestone is eroded. For instance, within the Mount Pleasant lode and the Arkansas lode, and in the area between those lodes the overlying cherty limestone which overlies the phosphate series is entirely eroded, and you could not show its presence there.

Q. What has been the cause of the erosion at that point?

A. The natural erosion of the mountain surface.

Q. At Montpelier Creek? A. Yes, sir.

Q. And the gulch? A. Yes, sir.

Q. Now, outside of that limited territory, why did you not place the boundaries I have mentioned on Exhibit 2?

A. Throughout the whole extent of the Waterloo placer the cherty limestone has been entirely eroded, and you could not exhibit it. Upon the Overton, the Cumberland, Fentress, [631] Jintown, Obed

(Testimony of Fred B. Weeks.)

and Obey lodes, the cherty limestone is exposed in places along the side of the ridge above and to the west of the black line.

Q. Why did you not place that on there, or could you place it on there now?

A. It is only exposed at varying points.

Q. Could you place those points on Defendant's Exhibit 2?

A. Why, I could place some of them.

Q. Please do so.

A. But I couldn't say that it would be exactly accurate, but it would be very close to it.

Q. You have your minutes or notes that you took, I understand you? A. Yes, sir.

Q. So that it would be approximately correct?

A. Well, I have not noted in my notes in many cases where the cherty limestone actually outcrops; but I can make an approximate location.

Q. You can mark it as approximately correct as the heavy line is, can't you?

A. No, I couldn't, because it has not been opened by cuts and tunnels and underground workings to show its position, in places where it is not naturally exposed.

Q. So far as you know, will you please place it on Exhibit 2 and cross-sections.

A. How do you wish it marked?

Q. Well, what would you suggest—the upper—what do you call it? [632]

A. It has been called on Section A-B "Cherty



(Testimony of Fred B. Weeks.)

Limestone." You can call it that, or just as you like.

Q. All right; that will do. It will be called "Cherty Limestone."

(The witness marked upon the map.)

A. You see, the point is that along—going up this way, that marked as a ridge, the Cherty Limestone is exposed; and that is what I am trying to show on this cross-section.

Judge DEY.—The witness is marking on Defendant's Exhibit 2 with a blue pencil, writing the word "Cherty" over the line drawn by him.

Q. Now, go ahead.

(The witness continued to mark on said map.)

A. According to my recollection, that is the point where the Cherty Limestone was exposed at the surface, where I have marked.

Q. There may be others, but you don't recall them now?

A. It is already marked on this section, A-B.

Q. It is already? A. Yes, sir.

Q. You have given the dip here as being to the West?

(Indicating upon said map.)

A. Yes, sir.

Q. And the degree of dip. Now, about the surface of the mountain to the west; what is the dip or slope?

A. Well, it varies from point to point, from probably  $10^{\circ}$  or  $12^{\circ}$ , up to quite steep— $35^{\circ}$  perhaps.

Q. Where is the steep part? [633]

A. Usually in the higher part of the mountain, to

(Testimony of Fred B. Weeks.)

the east of the black line. Of course there are exceptions to that; for instance, along the Mount Pleasant lode, the slope coming up from Montpelier Canyon to the black line is very steep; it is probably more than  $35^{\circ}$ ; and many outcrops of the underlying limestone are shown there, making nearly a cliff. It is a very steep slope.

Q. That is where the erosion occurs?

A. Yes, sir.

Q. Now, there is another separate cross-section here. (Placing Defendant's Exhibit 3 on easel.) On this cross-section the upper bed of phosphate, or the upper cherty limestone is not shown.

A. It has been entirely eroded.

Q. At that place? A. Yes, sir.

Q. Why did you select that place to make a cross-section?

A. I wanted to show its position through the underground workings of the Waterloo mine, where it is well exposed, and where a man could locate it definitely; and it also shows the known extent of the bed on the dip.

Q. You had no purpose of taking a special place where erosion had carried off and taken away the overhanging cherty limestone?

A. No, sir. It is shown on both cross-sections on Defendant's Exhibit 2 as in its position.

Q. If I understand you correctly, we have in both the Idaho and Wyoming ground this deposit found, with the dip and [634] strike which you have given? A. Yes, sir.

(Testimony of Fred B. Weeks.)

Q. Did you give the dip and strike in the Wyoming ground?

A. I gave the dip and strike as approximately north and south.

Q. And what was the dip there?

A. In one case the dip is  $85^{\circ}$  to the east. That is the general dip of the strata.

Q. Eh?

A. That is the general dip of the strata on the Wyoming claims. It is about  $85^{\circ}$  to the east.

Q.  $85^{\circ}$  to the east? A. Yes, sir.

Q. And what is the strike?

A. North and south.

Q. What do you find there from your examination in the way of the underlying rock?

A. The underlying rock is a silicious limestone.

Q. And on top of this silicious limestone what did you find? A. The phosphate series.

Q. Of what thickness?

A. About 120 feet thick, I think the entire series is.

Q. And it varies, does it not?

A. Well, I couldn't say as to that, because there are very few places where the entire thickness is shown; but I am giving it where I have measured it, where it is exhibited.

Q. And on top of this series what is there? [635]

A. Cherty limestone.

Q. Forming the upper boundary? A. Yes, sir.

Q. Within this series what do you find?

(Testimony of Fred B. Weeks.)

A. A series of phosphate beds, and limestone and shale.

Q. Can you tell us how silicious some of the dividing beds are in this phosphate series?

A. That, I couldn't say. They probably contain some silica, but not in any considerable amount so that one would call a layer within the phosphate series a silicious limestone.

Q. The question was whether you could answer how silicious it was? A. No, I couldn't.

Q. Now, in both places you found this phosphate series, bounded as you have described, in place in the mass of the mountains, did you not?

A. It is in place exactly as the overlying and underlying rock are in place in the mountain.

Q. And it is in place as much as any other rock is in place in the mountain, is it not—can be in place?

A. Yes, sir—in that way.

Q. Eh?

A. In that way—the same as all its surrounding rocks and associated rocks are in place.

Q. Well, is there any question in your mind about it being in place? A. Oh, I don't think so.

Q. What do you understand by a lode? [636]

A. A lode would be a rock mass containing metallic minerals. It may be that it has some distinct form, and it may have a very irregular form.

Q. It must contain a metallic mineral?

A. Yes, sir.

Q. That is your opinion?

A. Well, it is the opinion of myself and all author-

(Testimony of Fred B. Weeks.)

ities that I know anything about.

Q. Geological authorities?

A. Yes, sir, and mining authorities as well.

Q. Now, what do you understand by a vein?

A. A vein is a material which fills a fissure or crack in the earth's surface, and it may or may not contain valuable material; it may sometimes be present and sometimes absent, and yet be a vein.

Q. What do you understand by a vein containing valuable mineral deposits?

A. A vein containing valuable mineral deposits is one that contains metallic ores—that is, metallic substances—which are in sufficient quantity and in proper combination that they can be profitably extracted.

Q. This asphalt rock is a mineral vein rock, is it not? A. Yes, sir.

Q. But if I understand you correctly, it is lacking in metallic matter? A. Yes, sir.

Q. Would you agree with this definition of a lode or vein, namely: as a body of mineral, or mineral body of rock, within [637] defined boundaries, in the general mass of the mountain?

(No answer.)

Q. That is a definition of a vein?

A. Just read that, Mr. Hamer.

(The last question was repeated.)

A. No, sir.

Q. Eh? A. No, sir.

Q. You wouldn't agree with that? A. No, sir.

Q. Wherein do you differ?



(Testimony of Fred B. Weeks.)

A. It might be mineral-bearing without containing metallic minerals.

Q. That is the only difference? A. Yes, sir.

Q. In the ground under consideration in these several cases, do you find any conditions not complying with the definition I have just asked you about?

A. Yes, sir.

Q. What?

A. They don't contain any metallic minerals—

Q. I will read you again. Supposing that a vein or lode is a body of mineral or mineral body of rock within defined boundaries in the general mass of the mountain; would you say that the deposit or deposits in question come within such a definition?

A. They do not.

Q. In what respect do they differ?

A. They differ in respect to its metallic contents; but [638] the definition you have given is not a comprehensive definition of a vein; therefore this deposit varies from the proper definition of a vein.

Q. I am asking you upon the definition I gave you, whether proper or otherwise. If you don't understand it, the Reporter will read it.

A. I think I understand it. My statement is that it differs from it because of its lack of metallic contents.

Q. Was there anything implying metallic contents in the definition I suggested? A. No, sir.

United States  
Circuit Court of Appeals

For the Ninth Circuit.

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Transcript of Record.  
(IN THREE VOLUMES)

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MORSE S. DUFFIELD and LEWIS A. JEFFS,  
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VOLUME III.  
(Pages 593 to 874, Inclusive.)

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Upon Appeal from the United States District Court for  
the District of Idaho, Southern Division.

FILED

DEC 30 1912

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No. 2203

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(Testimony of Fred B. Weeks.)

Q. Well, taking the definition as I have given it to you, wherein do you distinguish this deposit or these deposits under consideration?

A. The phosphate deposits do not contain any metallic minerals—ores.

Q. Mr. Weeks,—

A. And your definition does not imply that the vein or lode must contain metallic substances.

Q. Well, inasmuch as the question I have asked does not imply any metallic mineral, wherein (I ask you again) does the deposit or deposits under consideration fail to come within the definition suggested?

A. I don't see that I can answer your question more specifically than I have already stated: —because it lacks in metallic constituents.

Q. It is leaving out entirely, Mr. Weeks, metallic constituents; and leaving that out, wherein is there any difference? [639]

A. The phosphate deposit is a mineral-bearing rock, and in this case it agrees with the definition you suggested.

Q. Take, for another example, this definition: “A continuous body of mineralized rock, lying within any other well-defined boundaries of the earth's crust, and under it.” Does the deposit or deposits in question come within such a definition of a lode or vein?

A. The deposit or phosphate is not a mineralized rock; it is not a rock in which minerals have come into in any way; it is a rock in itself. We can call a limestone a mineralized rock, or almost any rock that you could name is a mineralized rock; but yet

(Testimony of Fred B. Weeks.)

it does not come within the meaning of the definition which you have suggested.

Q. This deposit is a continuous body?

A. Yes, sir.

Q. It is a mineralized rock?      A. No, sir.

Q. Is it not?

A. No, sir. In the sense that mineral has come into a rock, it is not mineralized rock. All rocks are formed of minerals.

Q. In this continuous body do you mean to say that the rock contains no mineral?

A. It is all mineral—the whole rock is mineral.

Q. Well, then, it is mineral rock?

A. Well, it is mineral rock the same as all rock is mineral rock.

Q. Well, it is mineralized rock, if you please?

A. No, sir. [640]

Q. Now, your definition is so fine—to me, at least,—that I must ask you to give it again.

A. My conception of a mineralized rock is a rock in which mineral has come in some form after the formation of the rock itself. All rock is mineral of some kind or other; but it is not necessarily mineralized rock.

Q. Rock containing phosphorus would be mineralized rock, would it not?

A. I don't know any rock containing phosphorus.

Q. Well, rock containing tricalcic phosphate—phosphorus—would be mineralized rock, would it not?      A. No, sir.

Q. It wouldn't?      A. No, sir.

Q. Why?

(Testimony of Fred B. Weeks.)

A. Because the rock was formed as a whole, and no mineral matter has come into it subsequent to the formation of the rock itself.

Q. I see. So that if we should assume that any mineral substance had come into this rock since the rock was formed, your answer would be different?

A. Yes, sir, in part it would be. It would depend upon the circumstances.

Q. With that assumption, what would your answer be?

A. That as a general proposition it would not be mineralized rock.

Q. What, in that connection, in your opinion, would be required to make it mineralized rock?  
[641]

A. It would require a mineralization, to some extent, to be considered mineralized rock. Simply a little particle of mineral that might be found in a rock as an accidental occurrence I would not term that rock a mineralized rock.

Q. Yes. Now, coming back to the rock in question: If there had been a subsequent deposition of any of the mineral constituents, under any conditions, would you call this body mineralized rock?

A. That would depend upon the amount of deposition of such material.

Q. Take the ore deposit, or the deposit in question, what would be necessary, as a secondary deposition, to bring it within your idea of a mineralized rock?

A. There would have to be a deposition of a noticeable amount of secondary minerals.

Q. What? What minerals?

(Testimony of Fred B. Weeks.)

A. Well, any minerals.

Q. Well, coming to this rock—a deposition of what?

A. Why, you could name any of the metallic minerals that might be deposited in it.

Q. Name them, that are now found in it.

A. There are none.

Q. You were not asked about metallic mineral. Leaving out from your consideration metallic, will you please answer my question?

A. Calcium phosphate; iron; aluminum. Those are the principal constituents.

Q. Would any one of the three you have mentioned suffice? [642]

A. That would depend upon whether they came into the rock after the rock was formed or not.

Q. But we are assuming, Mr. Weeks,—

A. Well, as I have said, that would depend upon the amount of the mineralization, whether I should call it a mineralized rock or not.

Q. Taking this rock as you have found it to be, in any of the ground involved in these cases?

A. Well, at no place have I ever seen the deposition of minerals after the formation of the rock itself—of any minerals.

Judge DEY.—That, I beg to say again, is not the question. The Reporter will read it.

The Special Examiner thereupon repeated the following question:

“Q. Take the ore deposit, or the deposit in question, what would be necessary, as a second-

(Testimony of Fred B. Weeks.)

ary deposition, to bring it within your idea of a mineralized rock?"

A. It would require the removal of some portion of the phosphate rock, and the deposition in its place of a considerable amount of other mineral material.

Q. What, as applied to the deposit in question?

A. Well, I would have to illustrate that by supposing that the cementing material which cements these oolites together, was dissolved and removed, and in its place, for instance, iron formed the cementing material, replacing and taking the place of this cementing material which had previously been there.

Q. Take the deposition of calcium phosphate, and assume [643] that it was a subsequent deposition, in these deposits under consideration; what would you say, then, as to whether or not this deposit was mineralized rock?

A. I think you are making an impossible condition. I cannot conceive of what material in this rock can be removed and replaced by a further amount of calcium phosphate.

Q. That is your only answer?

A. I think that is the best answer I can give.

Q. Assuming that any of the minerals found in the deposit in question, in the quantities in which they exist there, came in that position by replacement, or secondary deposition, what would you say under those conditions as to whether or not this deposit is mineralized rock?

A. That would depend on the amount of such replacement, or secondary deposition.



(Testimony of Fred B. Weeks.)

Q. The question covers that phase of the matter, I think you will find.

A. The question says "any." I say it depends on the amount.

Q. Taking the amount as you have found it to be in the deposit in question?

A. Well, under the terms of your question, I don't think I could say that it was mineralized rock.

Q. Wherein are the terms of my question ambiguous to you?

A. I don't know that I can explain. I simply don't comprehend what you are driving at, probably. I am trying to make the best answers to your questions that I can.

Q. When I say to you that assuming any one or more of the [644] minerals that you find contained within the rock in question, to the extent and quantity that you find, were a subsequent deposition, would you consider this rock mineralized rock?

A. No, I don't think so.

Q. Why not?

A. To make this phosphate deposit what you would term a mineralized rock, would require the deposition in some form of mineral substances so as to change its constitution from what it was originally to something else quite different; and to warrant using the term "mineralized rock," would require the deposition of a considerable amount. And in this phosphate rock, in its present constituents and in the amounts of materials which we find there, I can't conceive of what portion of what materials, or

(Testimony of Fred B. Weeks.)

what portions of such materials, could be removed by any known process of nature and other materials put in its place to that extent that we would call it a mineralized rock.

Q. Wherein is it lacking in being a mineralized rock?

A. Because it is the rock itself, and it is not mineralized, as I have explained before.

Q. Assuming the subsequent deposition that I have stated before, of any or all of the mineral substances contained in the rock, do you still insist and state that it is not mineralized rock?

A. Yes, sir. I think I answered that question before.

Q. How is limestone dolomatized?

A. Well, the dolomatization occurs at the same time that the limestone is formed.

Q. How, is the question.

A. By the presence of magnesia. [645]

Q. You say "at the time the limestone was formed." Are you positive of that? Do you know it?

A. Why, the same as I know the mode of formation of any sedimentary rock—by the study of the rock itself.

Q. Well, do you claim to know? A. Yes, sir.

Q. If this is not mineralized rock, is it mineralized matter? A. No, sir.

Q. It is not mineralized matter?

A. No, sir. It seems to me I can make that point clear by stating that no matter whether you call it

(Testimony of Fred B. Weeks.)

mineralized matter or mineralized rock, the matter or rock must have been in existence in the first place, and then some of it removed and mineral matter come in later.

Q. That is what I am assuming as happening or occurring; and upon that assumption would you change your answer heretofore given?

A. No, sir; because I have said that in this phosphate bed I cannot conceive of any process by which you are going to remove any considerable portion of the materials which now form it, and replace it by something else which is mineral-bearing.

Q. But the question, notwithstanding, is based upon the supposition that such a change had been made, or occurred —

A. Well, I can't conceive—

Q. — and upon that supposition, please answer.

A. I should say, no, sir, then.

Q. Why do you say "no" to that? [646]

A. Because it is an impossible condition.

Q. You know that, do you?

A. I am satisfied of it.

Q. Do you know it? A. Yes, sir.

Q. What is the source of your knowledge?

A. A study of the materials.

Q. And you are so firmly fixed in that, that you could not even suppose for the purposes of a question that it was otherwise? A. No, sir.

Q. What? A. No, sir.

Q. Suppose that five feet in width or thickness of this phosphate rock, instead of being found lying in

(Testimony of Fred B. Weeks.)

place, conformable to the stratification, existed in a fissure, cutting the beds; what would you say as to the fissure so filled constituting a lode or vein?

A. I couldn't say anything about it, because it is simply a physical impossibility for this bed to have occupied any such a position.

Q. Assume, notwithstanding, that it did; please answer.

A. Well, your assumption is absurd from my standpoint, and therefore I cannot use it. When I say that it cannot exist under those conditions, why I don't see how I am going to assume anything about it.

Q. You have testified this morning to a fissure cutting the bed filled with Gilsonite, or asphaltum, or some hydrocarbon, it makes no difference what; have you not? [647] A. Yes, sir.

Q. Now, just assume that that fissure, of the width or breadth of five feet, was filled with this material.

A. Well, the fact is that such a fissure cannot be filled with this material.

Q. Suppose it was; what would you say as to it being a lode or vein?

A. I haven't anything to say of such a supposition. It is unreasonable.

Q. Eh? A. It is an unreasonable supposition.

Q. In what respect is it so unreasonable that you cannot answer?

A. Because you couldn't fill a fissure with this material.

Q. You don't refer to me personally, do you?

(Testimony of Fred B. Weeks.)

A. I did not intend any such reflections at any time. I was referring to the phosphate bed.

Q. Well, suppose I did fill such a fissure with such material; will you please answer the question?

A. I cannot imagine such a condition.

Q. And assuming such a condition to actually exist, and assuming that such a condition did exist; wherein would it not be a lode or vein, in your opinion?

A. I don't care to make an answer to an unreasonable supposition. I consider that so unreasonable that I can't answer it.

Q. With all your remarkable knowledge and learning as to the genesis of ore deposits, do you still insist that the question [648] is so foolish that it is not worthy of an answer from you, Mr. Weeks?

MR. BUDGE.—We object to the question as improper; as insinuating; and as offensive; and as not proper in view of the evident attempt of the witness to be fair and responsive.

JUDGE DEY.—I don't mean it in any sense offensive; but this witness has taken over an hour in refusing to answer a question based upon the supposition or suppositions I have stated, and I think it is justified under the conditions that now exist.

WITNESS.—The witness wishes to have it read into the record, and state that he has attempted to answer each and every question of counsel for the plaintiff, to the best of his ability; and in so far as he is able he is willing to answer all questions assuming any proposition; but when those assumptions relate to matters that are a physical impossibility, I don't



(Testimony of Fred B. Weeks.)

think that it is necessary for me to answer them, in assuming something that I consider cannot happen.

Judge DEY.—Are you through with your speech?

WITNESS.—Yes, sir.

Judge DEY.—Why did you want to inject those remarks into this record?

Mr. BUDGE.—We object to that as immaterial, [649] and a continuation of unfair conduct on the part of counsel.

Judge DEY.—Where have I been unfair in any question asked you, Mr. Weeks?

WITNESS.—I didn't state that you had been unfair.

Mr. BUDGE.—I stated it, Judge.

Q. Is it because it is impossible for you to answer, or because you decline to answer the question, assuming this phosphate rock which you have described was found in the form of a fissure cutting the bed, whether in your opinion it would be classified as a lode or vein?

A. As I have stated before, I consider it a physical impossibility for the material of this phosphate deposit to occupy a fissure or vein; therefore I decline to answer upon such an assumption—something that is impossible.

Q. Now, supposing that this deposit, in the form it is now found, was valuable for gold or silver or copper or lead; what would you say as to it being a lode or vein?

A. I think it would depend upon the form and character of such a deposit of gold or silver or lead,

(Testimony of Fred B. Weeks.)

or other materials that I mentioned as to whether I would consider it a vein or lode.

Q. I say, sir, in the form and character in which this deposit is now found, as you have described it, with strike and dip, in place, between walls, in the body of the mountain?

A. I don't think, if it occupied the same position and occurred in the same form and character as this phosphate bed, that it would be a vein or lode. [650]

Q. It would be a placer, would it?

A. No; I shouldn't term it a placer in the true—

Q. What would you term it?

A. I don't know of any distinct name you could call it, other than a bed, if it existed in the same form and character as this does.

Q. Wherein would it not be a vein or lode, in your opinion?

A. Because it is the original deposition of the material in the place in which it was formed.

Q. This gold or silver or copper or lead matter?

A. Yes, sir.

Q. Then, it is your opinion that wherever metallic minerals in paying quantities are found, unless produced by secondary, or brought by secondary deposition to the place where they are found, it would not be a vein or lode? A. No, sir.

Q. Is that the only reason?

A. I wouldn't want to say positively that that was the only reason; it is the essential reason.

Q. What other reason have you to put forth?

A. I haven't any in mind at the present time.

(Testimony of Fred B. Weeks.)

Q. Then, it is your opinion that whether rock in place, with continuity, strike and dip, valuable for metal or mineral therein contained, is to be located as a vein or lode, is to be determined by ascertaining the time and source and origin of the metal or mineral, is it? A. That is only in part. [651]

Q. In part that is true?

A. In part that is true.

Q. Now, what else?

A. That is not the principal part.

Q. What else is there essential.

A. The principal thing is the form and character of the deposit itself.

Q. In what particular form must the deposit be in, as distinguished from the form in which this deposit is found, to be located as a vein or lode?

A. The materials which constitute a vein or lode must be of a secondary nature, and have come to its place at rest at a time later than the formation of the enclosing rock masses.

Q. Perhaps I didn't understand what you meant when you used the word "formed," in which it is found. Will you please make clear what you mean by the use of the word "formed," in that connection?

A. In this deposit of phosphate of lime, it occupies a definite position between layers of sedimentary rock; it always occupies that position; it always has that same form of a sedimentary bed, enclosed, and following the dip and strike of the beds which enclose it. A vein or lode does not conform to the dip or strike of the rock which encloses the vein or lode, and

(Testimony of Fred B. Weeks.)

the materials are not necessarily the original materials which are in that vein or lode.

Q. Have you now mentioned all the distinguishing characteristics that you desire to in the use you make of the word "formed," and characteristics? [652]

A. I think those are the distinguishing features—what I think of.

Q. What you have in mind?

A. Yes, sir; what I have in mind at the present time.

Q. It is your opinion, then, that there is and can be no such thing as a stratified lode or vein? Please answer.

A. There can be no stratified vein or lode formed as a stratified rock is formed.

Q. Is there or can there be any such thing as a stratified lode or vein, valuable for its mineral contents? A. No, sir.

Q. Why do you say there cannot be such a thing?

A. I don't think you could lay down materials into strata in such a form as to form a stratified vein or lode.

Q. Do you mean to say that there is no such vein as a stratified vein or lode? A. Yes, sir.

Q. That is to say, from your observation and experience you state that? A. Yes, sir.

Q. Outside of this Western Phosphate Area, your practical experience and investigation has been very limited, has it not?

A. No, sir; I don't think so—not outside of the Western Phosphate Field. I should say it was extensive.

(Testimony of Fred B. Weeks.)

Q. Outside of that? A. Yes, sir.

Q. In mineral deposits? A. Yes, sir.

A recess was thereupon taken until two o'clock P. M. [653]

At two o'clock P. M. the hearing was resumed.

FRED B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination.

(By Judge DEY.)

(At the request of Judge Dey, the Special Examiner repeated the latter part of the testimony of this witness just prior to adjournment for the noon recess, as follows:)

“Q. Do you mean to say that there is no such vein as a stratified vein or lode? A. Yes, sir.

“Q. That is to say, from your observation and experience you state that? A. Yes, sir.

“Q. Outside of this Western Phosphate Area, your practical experience and investigation has been very limited, has it not?

“A. No, sir, I don't think so—not outside of the Western Phosphate Field. I should say it was extensive.

“Q. Outside of that? A. Yes, sir.

“Q. In mineral deposits? A. Yes, sir.” [654]

Q. Assume that this deposit that dips 85° that you have described, consisted of apatite instead of the present—of the materials that you have described here; what would you say as to whether or not it



(Testimony of Fred B. Weeks.)

would be located as a lode or vein?

A. If this material comprising this bed of phosphate was composed entirely of apatite, in its crystalline form, it would be a mineral-bearing deposit.

Q. Would it be a ledge or vein, in your opinion, and locateable as such?

(No answer.)

Q. We are waiting.

A. Yes, sir, I understand. I think there are conditions under which this bed, as a whole—composed entirely as a whole of the mineral apatite, might be located as a vein or lode.

Q. Properly so, in your opinion? A. Yes, sir.

Q. And I will ask you now the same question, substituting in the place of apatite, paramorphite?

A. It might be.

Q. Why do you say "might be"?

A. Well, there might be a difference of opinion about it, in my opinion. As I said, under proper conditions it probably would be, or could be.

Q. And your opinion is that it would be proper to locate it as a lode or vein?

A. When I answered yes to that question, my answer was under the supposition that this whole bed represented by the phosphate would be represented by the mineral form paramorphite, as you suggest. [655]

Q. That was the question. That is to say, or economic or commercial value? A. Yes, sir.

Q. Isn't phosphorite and allotropic a form of apatite?

(Testimony of Fred B. Weeks.)

A. Phosphorite is a variety of apatite, which has a given density, form, and its particular structure being fibrous, or radiating.

Q. Assume now, if you please, that this deposit, with the dip, strike, position and place as you have described it, was phosphorite, in your opinion, would it not be properly located as a vein or lode?

A. Bearing in mind that the whole bed is to be made up entirely of the variety of apatite called phosphorite, it would be located as a vein or lode.

Q. I wish you would, if you can, answer the question without any further assumption than the question conveys.

A. Well, I am answering it with that in mind that I have stated.

Q. Can you answer the question yes or no?

A. No, sir.

Q. Why?

A. I don't think it can be answered that way.

Q. Well, why?

A. It would not be a proper answer.

Q. Why not?

A. Because your answer would be incorrect, if you said yes or no.

Q. Tell us why. [656]

A. I don't see how I can go any further.

Q. You can't explain why it would be incorrect?

A. Other than what I have said.

Q. I ask you the question again: Assuming that this deposit in question, with the strike, dip, continuity, boundaries and form in which you have de-

(Testimony of Fred B. Weeks.)

scribed it, consisted of phosphorite, whether or not in your opinion it would be a vein or lode, and locateable as such?

A. When I say yes to that question I have the same thought in my mind that I have expressed before.

Q. Please answer the question as now asked.

A. I have answered it to the best of my ability.

Q. Answer it again.

A. Yes—bearing in mind what I have said before that I had in mind.

Q. Bearing in mind what?

A. That the whole bed of phosphate, in its entirety, is made up of the variety of apatite in the crystalline form of phosphorite.

Q. Why do you affix the requirement indicated by the words “whole bed is made up”?

A. Because that should be a condition.

Q. Why do you place that condition, is the question?

A. Because the condition may exist in which only a portion of the bed is made up of phosphorite; and it might not, in my opinion, then be a vein or lode.

Q. I am assuming that the portion is of commercial or economic value?      A. Yes, sir. [657]

Q. Now, explain clearly, please, just why you make the distinction between the whole and a portion?

A. Because I think it is necessary that the whole of this bed should be formed of the mineral phosphorite.

Q. Well, why the whole, rather than a profitable

(Testimony of Fred B. Weeks.)

part or portion thereof?

A. Because it would be necessary to mine the whole of it—to use it as mined as a whole.

Q. To make it a lode or vein, is the question.

(No answer.)

Q. We are waiting.

A. Yes, sir, I understand. I think it would be necessary that the bed be formed in its entirety of the mineral phosphorite in order to make it a mineral-bearing rock, subject to the vein or lode location.

Q. Just explain why.

A. It would require those conditions in order to have the form and character of a deposit subject to vein or lode.

Q. That is just what I want to know, wherein it would require the entire deposit rather than a valuable part of the deposit, to make it a vein or lode.

A. The material which comes from the vein or lode contains a valuable material, and other nonvaluable materials, which we call gangue, and we separate the gangue material to get the valuable portion of it. In the phosphate material we mine it as a whole and use it as a whole; we do not separate it to get out any valuable particle of it.

Q. Do you consider that you have just answered the plain, [658] simple question, why (substituting phosphorite) the entire deposit must be phosphorite, rather than a portion of it, assuming the portion to be of economic value? A. Yes, sir.

Q. Then, your position is this, is it not: That if this entire deposit was phosphorite, it would properly be

(Testimony of Fred B. Weeks.)

classed and be located as a vein or lode; but that if only a portion of the deposit was phosphorite, notwithstanding it had a commercial or economic value, the deposit would not be a lode or vein?

A. Yes, sir.

Q. Just state again, please, where you draw the line of demarcation under the two conditions as given.

A. That the vein or lode is composed of its valuable material and gangue material; and that it is necessary to separate the two to get out your valuable material. In this case, the phosphate comprising the whole bed is mined and used as a whole.

Q. But in the one instance it would be a lode or a vein, and in the other a placer? Is that your position?

A. Well, my position is that it is not a vein or lode; whether it comes under the proper term of "placer" is a question as to the interpretation of what one puts upon "placer."

Q. Now, Mr. Weeks, a miner or a prospector desiring to make a location, finding a valuable deposit of mineral in the mass of the mountain, with a regular defined dip and strike, and between walls of sedimentary formation; what additional facts would you have to have to determine—before he could intelligently determine whether it was a lode or vein subject to location [659] as such?

A. I think it would be necessary for him to determine from the examination of the bed whether it had or had not the characteristics of a vein or lode.



(Testimony of Fred B. Weeks.)

Q. That fully answers the question, does it?

A. Why, there might be other considerations; I think that is the principal one—the determining factor.

Q. Well, is there any other, in your opinion?

A. I think that covers the ground.

Q. If the prospector found that the mineral deposit conformed to the stratification, then it is your opinion, is it not, that it is not a lode or vein?

A. It would in most cases wherein the vein or lode would follow along the bedding-planes between the sedimentary strata.

Q. Any other exception?      A. I think not.

Q. Now, just illustrate what you mean by the exception you have just given.

A. Where the mineral-bearing solutions, penetrating the strata of the earth's crust, instead of cutting across a bed finds the point of least resistance along the bedding-planes between these beds—would constitute the principal example.

Q. In other words, the prospector would have to determine as to the action of the mineral-bearing solutions; is that it?

A. He would determine that from his observation of what the material itself said.

Q. That would be one of the things he would have to determine? [660]

A. Yes, sir; and he would determine it in that way.

Q. He would determine it in what way?

A. By his observation.

Q. Of what?

(Testimony of Fred B. Weeks.)

A. Of the bed of the material he was examining.

Q. What observation would be necessary to make that determination?

A. Why, he would find on exposure of the material that the ore-bearing horizon was following the line between two sedimentary strata—an observation not very difficult to make.

Q. Well, if he found that would it be a vein or lode? A. Yes, sir.

Q. It would be? A. Yes, sir.

Q. Then, in your opinion, it would be necessary—it would be limited only to deposits formed from solutions? A. A vein or lode would be.

Q. In other words, the prospector in such a case would have to determine the source from which the mineral came, would he? A. No, sir.

Q. He would not be? A. No, sir.

Q. The manner in which it came?

A. In a sense, yes, in that the mineral-bearing solutions had followed along this bedding-plane, would be the manner in which it came into its place.

Q. Then, in a sense, it would be necessary to determine the [661] manner in which the mineral solutions came? A. Yes, sir.

Q. If they came and were deposited by such action, it would be a vein or lode, in your opinion?

A. Yes, sir.

Q. If, on the contrary, it came by having been placed where it is before the period of the uplift or deformation, it would not be a vein or lode; is that right?

(Testimony of Fred B. Weeks.)

A. I don't quite see that connection. Will you read that?

(The last question was repeated.)

A. I don't think so.

Q. It would still be a vein or lode?

A. Yes, sir, it might be.

Q. It might be? A. Yes, sir.

Q. Why do you say "might" in that connection?

A. Well, I will say it is.

Q. Yes—a vein or lode? A. Yes, sir.

Q. Then, if I understand you, if at any past period, whatever position it might have occupied, the mineral deposit came in solution and was deposited, forming beds, it would at the present time be a lode or vein? Is that it?

(No answer.)

Q. In other words, to make it a little clearer, is it of any importance, in your opinion, the determination of when the mineral deposit was formed?

A. It is of importance in this sense, that the mineral-bearing [662] solutions from which the minerals are deposited, enter into a rock already formed, and that the formation of such ore-zones are later than the materials which the ore-bearing solutions are penetrating.

Q. Then, it is your opinion that a prospector, in determining whether the deposit found in the form you have described to be the one involved in these cases, is a vein or lode and locateable as such, he must determine whether it was filled with the mineral substances—whether it had been originally rock that

(Testimony of Fred B. Weeks.)

had been subsequently filled with mineral substances; is that it? A. Yes, sir.

Q. How would that be determined by the miner—the ordinary miner and prospector?

A. In the ordinary vein or lode from the out-crop the prospector could determine more or less accurately the boundaries of his vein or lode, and the fact as to whether the ore had come into such rock subsequent to the formation of the country rock.

Q. He would know all about it, eh?

A. Oh, I don't know that he would know all about it. He would from the general observations he would make, I think. In fact, I have talked with many prospectors who have exhibited such a knowledge.

Q. Is phosphoric acid carried in solution?

A. No, sir.

Q. It is not? A. No, sir.

Q. How is it? [663]

A. It is carried in compound with some other material like this calcium phosphate.

Q. Well, in what way was it carried and deposited in this deposit?

A. I think in this deposit it was carried in solution as the chemical compound calcium phosphate.

Q. You think? A. Yes, sir.

Q. Do you mean to say you don't know?

A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. Which?

A. I mean to say that I think, not that I know.

(Testimony of Fred B. Weeks.)

Q. Do you know anybody that does know?

A. No, sir.

Q. At the time of it being carried, what was the bed or stratum—in what condition, and of what material?

A. The formation of the calcium bed began with the first deposition of the calcium phosphate upon the underlying limestone, and the bed was built up particle by particle, as these sediments were brought in and the matter in solution deposited.

Q. Particle by particle, like grains of sand?

A. Yes, sir, you may say so; that would be a comparison.

Q. Now, do you know that, or do you think?

A. I know it.

Q. You know it?      Yes, sir.

Q. Was the limestone replaced? [664]

A. There was no limestone there at the time this bed was being formed, except the bed that the phosphate rests upon.

Q. I understood you— Just read that answer back.

(The following answer was repeated:)

“A. The formation of the calcium bed began with the first deposition of the calcium phosphate upon the underlying limestone, and the bed was built up particle by particle, as these sediments were brought in and the matter in solution deposited.”

Q. Did it replace this underlying limestone?

A. No, sir.



(Testimony of Fred B. Weeks.)

Q. It didn't? A. No, sir.

Q. It was built on top of it? A. Yes, sir.

Q. That, I understand you to say, is not a theory but a fact? A. Yes, sir.

Q. Was it a bed of mud?

A. Probably of the consistency of mud at the time it was formed.

Q. "Probably?" Don't you know?

A. Well, I will say it was.

Q. Well, do you know? A. Yes, sir.

Q. How do you know?

A. From the study of the bed itself, and from the observations [665] of the formation of sediments at the present time.

Q. Now, will you please tell us if it came in solution as you have stated, why it cannot be found in fissures?

A. The fillings of fissures come from the interior of the earth, or from some portion of its crust. There were no fissures in existence during the formation of this bed for this material to fill.

Q. Now, do you think that answers the question?

A. Will you read the question?

(Said question was repeated.)

A. From the fact that the water carrying this material in solution is in a different form and different position than that which fills fissures.

Q. In what way? Just make it clear.

A. From the fact that this ocean water is carrying in suspension certain mineral matters, and it is spread out over a vast area; while the water carrying

(Testimony of Fred B. Weeks.)

mineral-bearing solutions in veins is confined within the limits of the veins and comes up from the depths of the earth.

Q. Did it undergo any leaching process?

A. This phosphate bed?

Q. Yes?

A. Except as a very small amount immediately upon the surface of the ground, at present there has been no leaching action.

Q. No leaching action?      A. No, sir.

Q. You were a witness last December, were you not, in the case of the Union Phosphate Company? You testified as a witness?      A. Yes, sir. [666]

Q. I read from your testimony, your direct examination, page 290 of the record:

“Q. Is it a sort of a leaching process?

“A. It probably was a leaching process, in that phosphoric acid had been brought into waters from time to time in which the phosphate bed was laid down, leading the other beds.

“Q. Now, what was the origin of the phosphoric acid? Does it come from the stone, or something else?

“A. Well, phosphorus is one of the most widely distributed elements that we have in nature.”

Is that your testimony?      A. Yes, sir.

Q. That is correct?

A. It is correct in connection with what it is taken.

Q. Is the statement there correct, or do you desire to change it now?

(Testimony of Fred B. Weeks.)

A. I don't desire to change that statement at all; but perhaps I can make it clearer as to what leaching was referred to in that statement.

Q. You say: "It probably was a leaching process, in that the phosphoric acid had been brought into waters from time to time in which the prosphate bed was laid down, leaching the other beds." Isn't that clear?

A. Well, "leaching the other beds" means the beds from which the phosphoric acid was originally obtained.

Q. Before transportation? A. Yes, sir. [667]

Q. What? A. Yes, sir.

Q. You didn't say so here, did you?

A. Well, that depends on your construction of it.

Q. No—I am asking yours?

A. I think so. That is what "leaching the other beds" refers to.

Q. Now, in answer to one of my questions a while ago, I understood you to say that phosphoric acid was not in solution at any time.

A. Well, I didn't mean to say that phosphoric acid—I meant to say that phosphoric acid alone is not in solution.

Q. The question was asked you in this record by your counsel, or by the counsel for the Union Phosphate Company.

"Q. Would you say the phosphate was deposited in solution?

"A. I think so, to a very large extent."

Now, that is the fact, isn't it?

(Testimony of Fred B. Weeks.)

A. That the phosphoric acid in combination as calcium phosphate was deposited. That is my statement now.

Q. Now, do you know whether the phosphoric acid replaced the limestone by metasomatic action?

A. No, sir.

Q. You don't know? A. No, I don't.

Q. Is it not apparent to you that a miner or prospector would have a grave problem on his hands, according to the basis you have given for determining whether this deposit would be a lode or placer?

[668]

A. Yes, sir, I presume he would have. I think it is a question to a good many people.

Q. One that even great scientific men differ upon?

A. No, I don't think so.

Q. Do you know Professor Van Hise?

A. Yes, sir.

Q. I was looking for his initials. A. C. R.

Q. Do you know of the Treatise by him on Metamorphism?

A. Yes, sir, I have read a good many portions of it.

Q. Is he of acknowledged reputation?

A. Yes, sir.

Q. And is his book a standard as authority on scientific matters?

A. Well, it would be considered as authority by those who agreed with his propositions. Perhaps those who don't agree with it would not accept him as an authority. He is an authority in that way, that not everybody agrees with him.

(Testimony of Fred B. Weeks.)

Q. Well, that is true of them all, isn't it?

A. Yes, sir.

Q. That happens with all? A. Yes, sir.

Q. But on science he is of reputable authority?

A. Yes, sir.

Q. Of recognized standard?

A. Taken as a general proposition, it is.

Judge DEY.—Mr. Jack, I wish you would help me out a little bit, and read certain paragraphs. [669] Now, wait a moment.

Q. Mr. Weeks, I read you from the treatise referred to, with a view of asking you whether or not you coincide, concur or not, with the position taken: Page 93, it is Volume 17, Van Hise, "A TREATISE ON METAMORPHISM," a publication of the Geological Survey:

Mr. JACK.—"Also the moderately strong acids  $H_2 SO_3$ , and  $H_3 PO_4$ , are not abundant, although phosphoric acid is rather widespread."

Page 206—

Mr. BUDGE.—Well, do you want to read them all to him?

Judge DEY.—Yes.

Mr. BUDGE.—I don't see how he can answer to them, if they relate to different matters. I think he could give a more intelligent answer if his answer was limited to one particular portion read, without going through the entire volume and then asking him for his answer to all of them.

WITNESS.—It would be impossible to give a direct answer in such a case.



(Testimony of Fred B. Weeks.)

Mr. JACK:

Page 206: "Phosphation is the union of phosphoric acid with base, or the substitution of phosphoric acid for another combined acid, in either case producing phosphates."

Page 356: "Occurrence.—Apatite is one of the most widespread, if not the most widespread, [670] of all the subordinate constituents of rocks. It is a common, if not an almost universal, constituent of the plutonic rocks, occurs almost as broadly in the volcanic rocks, and is found in many varieties of unaltered or little altered, sedimentary rocks, such as limestone, shales, sandstones, etc.; and, finally, it is almost everywhere found in the metamorphosed igneous and sedimentary rocks.

"Alterations.—The only alteration which is recorded for apatite is to osteolite, which is reported as having the same composition as apatite, except that there has been a loss of part or all of the fluorine or chlorine.

"It is certain, however, that in the belt of weathering of the zone of anamorphism apatite is slowly dissolved. This is shown by comparative analyses of the weathered with the unweathered varieties of the same rock. This fact has been frequently noted in reference to the iron ores, because here the presence or absence of phosphorus is of such great importance. It may be stated that in the iron ores it is the general rule that those parts of deposits which have been long subjected to weathering bear a smaller proportion of apatite than the continuations

(Testimony of Fred B. Weeks.)

of these same deposits in the belt of cementation."

"The depletion of the surface rocks in apatite [671] would seem to furnish an adequate source for the apatite in veins, this mineral being taken into solution near the surface and redeposited deeper down, thus being transported from the belt of weathering to the belt of cementation."

Page 975: "Phosphorous. According to Clarke's estimate of 1891 phosphorous forms 0.09 per cent of the outer ten miles of the crust of the earth, including the original rocks, hydrosphere, and atmosphere. All of it is in the lithosphere, of which it composes 0.10 per cent. In his estimate of 1900 Clarke reduces this amount to 0.09 per cent.

"Phosphorous is thus twelfth in the scale of abundance, ranking next to carbon, an element of vastly greater importance. Reckoned as an oxide Clarke's estimates of 1891 and 1900 are both 0.22 per cent. This gives phosphorous oxide eleventh place in the table of oxides. In the original rocks phosphorous is known to occur only in the mineral apatite, of which it composes 18.47 per cent. This mineral, while usually subordinate in amount, is very widespread. In the meteorites phosphorous is found in schreibersite ( $\text{FeNiCoI } 3\text{P}$ ). (See p. 946.) The amount of  $\text{P}_2 \text{O}_5$  in 78 shales is 0.17 per cent; in 624 sandstones 0.07 per cent; in 345 limestones not used for building purposes is 0.04 per cent, while in 498 limestones used for building purposes it is 0.42 per cent. [672]

"The amount of  $\text{P}_2 \text{O}_5$  in the limestones used for

(Testimony of Fred B. Weeks.)

building purposes rather than the average of all limestones is taken, as probably more nearly representing the average amount of phosphorous in these rocks, since it is well known that in the belt of weathering the phosphorous is leached out.

“Therefore it appears that the amount of  $P_2 O_5$  in the shales is about three-fourths of that present in the original rocks; in the sandstones is about one-third; and in the limestones is nearly doubled. If one multiplies the amount of  $P_2 O_5$  in each of the sediments by their estimated quantities, and adds them together, we have the following equation:

“.17 multiplied by .65 plus .07 multiplied by .30 plus .42 multiplied by .05 equals .1525.

“This shows a deficiency of about one-third of  $P_2 O_5$ , as compared with the original rocks. A portion of this deficiency is undoubtedly accounted for by the phosphate rock deposits, such as those of South Carolina, Florida, and Tennessee, and by the guano deposits. These represent the economic products of segregating processes which have increased the proportional amount of phosphorous many fold.

“All agree that the first stage of the segregation of phosphates in the sedimentary rocks is accomplished through the agency of animals. For [673] the guanos this first concentration is made by sea birds. For the more extensive phosphate deposits the first concentration of phosphorous was by invertebrate animals, such as brachiopods and crustaceans, and by vertebrates, such as sharks and saurians. Very commonly this first concentration is in lime-

(Testimony of Fred B. Weeks.)

stones. The further concentration of the phosphorous of guanos and that of phosphatic limestones and other rocks is by underground water. The circulations producing the concentration and the forms of the resultant deposits are multifarious, but the general principle applicable to most cases appears to be that the phosphates are dissolved by descending waters in the belt of weathering and thrown down on reaching the belt of cementation. Usually the latter reaction takes place in the upper part of the belt of cementation, so that the phosphates are segregated at or just below the level of ground water. The precipitation of the phosphates is especially likely to occur in limestone. Eldredge suggests that under such circumstances the precipitation is brought about by the simple interchange of bases between the phosphate and carbonate of lime thus brought together, or by the lowering of the solvent power of the waters through loss of carbonic acid. The latter would happen whenever the acid was required for the solution of additional carbonate of [674] lime, or when, through aeration, it should escape from the water. The zone of phosphate deposition was apparently one of double concentration, resulting from the removal of the soluble carbonate thus raising the percentage of the less soluble phosphate, and from the acquirement of additional phosphates of lime from the overlying portions of the deposit.

“The precipitated phosphate is likely to be deposited in nodules. This material is more resistant than the containing limestone. Through erosion by



(Testimony of Fred B. Weeks.)

streams or ocean there may be a further concentration of the phosphates due to the greater resistance of the phosphate to both solution and mechanical wear as compared with limestone.”

Judge DEY.—Q. Now, Mr. Weeks, does what has been read to you from Professor Van Hise bear a statement to which you concur?

Mr. BUDGE.—We object to the question on the ground that it is improper, involves several propositions—innumerable propositions—and on the ground that it is improper to read into the record at great expense the expressions of opinions such as have been read in this question.

A. There are some statements with which I wholly agree, some of them to which I would make exceptions, and others which I wholly disagree with. I might say that the principal matter considered as to the origin and formation of phosphate deposits, what was [675] read from Professor Van Hise related wholly to phosphate deposits of the Eastern United States, which differ entirely in form and manner of occurrence from the phosphate beds of Western United States, and that if Professor Van Hise had had the opportunity of studying these deposits his generalizations would not have been so sweeping. It would be impossible for me to designate the particular parts with which I agree and disagree, or to which I would make certain exceptions, without taking each and every proposition and considering and answering them separately.

Q. It shows, does it not, or illustrates, does it not,



(Testimony of Fred B. Weeks.)

that there is far from being any concurrence of views upon the subject?

A. No, I don't agree to that statement. I think there is a considerable concurrence of opinion as to the mode of formation of the phosphate deposits which he was considering; but that the phosphates which are here in question are different in a very great many respects from the ones which he was discussing.

Q. Formed at a different time? A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. A different age? A. Yes, sir.

Q. When did you find that out?

A. When I first began the study of phosphate in the West, in 1906.

Q. I notice that in your testimony in the case I have referred to you were applying southern and eastern phosphate [676] deposits to the western deposits.

A. There are certain of the eastern deposits which were formed in the same manner as the western deposits; but the phosphates of North and South Carolina, and the river and land pebble deposits of Florida, were deposited in a wholly different manner.

Q. Exactly.

A. You take the hard rock deposits of Florida, and the Tennessee deposits, the Arkansas deposits, I think they resemble these in a good many respects.

Q. The question I am trying to get an answer to is this: whether or not there are not different theories as to the origin of the phosphate deposits?

(Testimony of Fred B. Weeks.)

A. That is true, because the different beds of phosphate have a different origin and mode of formation. That is the reason that makes the difference in the ideas as to their formation.

Q. Then there is a difference? A. Yes, sir.

Q. Now, would you please state briefly the different theories advanced? You have given yours. Now, I mean in addition to the one that you have gone over—just briefly.

Mr. BUDGE.—Well, do you mean as to this particular deposit, or as to all deposits, Judge, so that the witness will understand just what you want. I don't understand, I am frank to say.

Judge DEY.—I mean generally—of the upper carboniferous age.

A. There are no phosphate deposits of the upper carboniferous age known except what occur in these western states. [677]

Q. Now, are there different theories as to that?

A. No, sir, none that I know of, as to those deposits.

Q. None that you know of? A. No, sir.

Q. These deposits are of comparatively recent discovery? A. Yes, sir.

Q. How many years?

A. I should say about six or seven years since they were first discovered.

Q. Since the first discovery? A. Yes, sir.

Q. Now, these corresponding types that you have referred to in other sections of the United States, is there a difference of opinion as to the origin and

(Testimony of Fred B. Weeks.)

mode of occurrence of those?

A. I don't know of any. In the descriptions of the Tennessee phosphates, which were made by the Geological Survey by Mr. Hayes, I have seen many quotations from that description, and I have never seen anyone who differed with him in any considerable extent. There is a considerable uniformity of opinion, agreeing with him as to the mode of origin of the Tennessee phosphates.

Q. Does the way in which the mineral deposit in question came to occupy its present position, in your opinion, have any bearing upon the question of whether or not it is a lode or vein, and locateable as such? A. Yes, sir.

Q. In what way?— You can state briefly your theory,—does it have a bearing?

A. From the fact that this deposit was laid down upon an [678] ocean bottom, in ocean water; while the materials of a vein are confined within the limits of fissures or cracks or crevices, pre-existing in the earth's crust.

Q. That is the only way it has any bearing?

A. I have described at considerable length what I consider the features of a vein or lode, or the characteristics of a vein or lode, and I do not consider that this bed shows any of those characteristics.

Judge DEY.—I move to strike that out as not responsive, and I ask the witness once more, is there any other—

Mr. BUDGE.—We resist the motion to strike.

Judge DEY.— —importance attached to the way in

(Testimony of Fred B. Weeks.)

which the mineral deposit in question came to occupy its present position, in determining whether it is a lode or placer, except the one just stated by you?

A. The materials forming the phosphate bed came into a position immediately overlying a limestone, and the rock which covers the bed is a limestone. There has been no mineralization along the cracks or crevices of the overlying or underlying limestones, which would make it simulate a vein or deposit; while in a vein or lode the mineral-bearing solutions do penetrate into the walls, or into the surrounding country rock where there are not walls.

Judge DEY.—I am afraid, Mr. Weeks, you do not understand the question. Will the Reporter read it slowly and distinctly?

(Said question was repeated, as follows:)

“Q. Is there any other importance attached [679] to the way in which the mineral deposit in question came to occupy its present position, in determining whether it is a lode or placer, except the one just stated by you?”

A. I don't see how I can answer that question except by stating the way in which the material came into this bed, and the way in which material came into a vein or lode. That is my understanding of the question, and I think I have answered it.

Q. You are not prepared to answer it in any other way, then, or further than you have?

A. It seems to me that I am answering the point of the question, from the way I look at it. I am trying to answer it.

(Testimony of Fred B. Weeks.)

Q. Is there any diversity of opinion upon the question as to the way in which phosphate deposits—phosphorite—came into its present position—that is, the position now found— A. — in this deposit?

Q. Oh, no—generally.

A. Well, as I have said before, there is a difference of opinion because there is a difference in the origin. It originates in different ways.

Q. I am now taking up the question of the way in which it came to occupy its present position, as now found, and I ask you if there is any difference of opinion upon that subject among eminent geologists?

A. No, sir; I don't think there is.

Q. Are not some of the opinions that phosphate came from mineral springs arising from the bottom of fissures? A. I think so.

Q. Hasn't the theory also been put forward that the deposits [680] were formed by a solution of phosphate and lime in carbonic, running from the surface downward into the fissure?

A. I think so. But these theories relate to some specific occurrence, and not as a general proposition covering all phosphates.

Q. Hasn't the theory also been advanced that phosphate beds are formed by phosphatic vapors arising up through the jurassic limestone, and phosphatizing it, and that similar action is going on even at the present time?

A. Yes, sir—as it relates to some specific occurrence—not as a general proposition.

Q. In the United States, taking the phosphate de-



(Testimony of Fred B. Weeks.)

posits that have been found, there is a difference of opinion existing as to the way they came in the form and position in which they are found at various places, is there not? A. No, sir.

Q. Take the origin of the Florida phosphates, is that known? A. Yes, sir.

Q. That is not a puzzling problem to geologists?

A. You might say it was.

Q. Are there different theories about it?

A. The theories may differ in some respects; but as a general proposition they are very much alike.

Q. What are the theories put forth, do you know, other than your own, as stated here?

A. For the hard rock phosphates of Florida, they are considered to be bedded sedimentary strata. The river and pebble deposits may be, and are, derived from the erosion of these hard [681] rock deposits in large part. There are also deposits which are considered to have been formed by the removal of the calcium carbonate in limestone, and leaving in its place the calcium phosphate, in nodular forms.

Q. In the Stony case, is it not the opinion that the phosphate has been deposited in a silicious limestone, replacing the lime? A. I think so.

Q. Another theory is that when the strata were lifted up off the sea level, and subjected to erosion, and the action of percolating waters charged with acids from the soil, the phosphate was leached out and carried to lower levels, where it was redeposited, either in cavities or by replacing limestone, is it not?

A. I presume that is correct.

(Testimony of Fred B. Weeks.)

Q. That is a theory advanced? A. I think so.

Q. You know that Mr. Eldredge advanced two theories, or don't you? A. No, I don't think so.

Q. Do you know who he is?

A. Yes, sir. He is dead now. I knew him when he was alive, very well.

Q. Did he write any works upon the question?

A. Yes, sir; he wrote a paper that was published in the American Mining Institute proceedings, on the Florida phosphates.

Q. Was he a standard authority? A. Yes, sir.

Q. Now, when did you enter the service of the Geological [682] Survey?

A. December 1st, 1890.

Q. 1890? A. Yes, sir.

Q. In what capacity?

A. The first work that I did was in assisting one of the geologists in going over his field-notes, and the preparation of his report upon certain field work which he had done.

Q. Were you an official or clerk?

A. That was official.

Q. What position?

A. Well, my official designation was that of a clerk, but I was doing no clerical work.

Q. Your official designation was a clerk?

A. Yes, sir.

Q. In what particular branch of the service?

A. In the Department of Economic Geology.

Q. And you continued in that position of clerk for how long?

(Testimony of Fred B. Weeks.)

A. I don't remember how long I held that official title.

Q. Well, that work?

A. Clerical work I wasn't doing.

Q. That work which you just described, how long did you continue at that work?

A. Why, that occupied several months—that particular piece of work.

Q. What next?

A. In the summer of 1891 there was held a meeting of the [683] International Congress of Geologists, and Mr. S. F. Emmons, a Geologist of the Survey, was appointed as its Secretary, and I was designated to assist him in all the work which he was carrying on in connection with this Congress, in the preparation of a publication which was entitled "GUIDE TO THE GEOLOGY OF THE ROCKY MOUNTAIN STATES," I think was the title, and for use in connection with this Congress of Geologists; and that occupied the summer of 1891, and the closing up of the affairs of this Congress occupied some time during the fall of 1891.

Q. And did you do bibliographic work?

A. My bibliographic work began in 1892.

Q. And how long did that continue?

A. Until 1907.

Q. Until 1907?      A. Yes, sir.

Q. That consisted of making indexes?

A. Yes. It was the reading of the articles, or going over them for the purpose of indexing them under the subject headings to which they related.

(Testimony of Fred B. Weeks.)

Q. Then, that was your principal service from 1892 until 1907? A. No, sir.

Q. Until what time did you say?

A. That was until 1907; but it wasn't my principal duties, it was only a part of them.

Q. Only a part of them? A. Yes, sir.

Q. What portion of the year did you devote to that part of your work? [684]

A. Usually the time from about the first of December until about the first of June, of each year; the balance of the time was in field work.

Q. That is, all of the year except between the first of June and the first of December?

A. Approximately that.

Q. That work you performed at Washington, D. C.? A. Yes, sir.

Q. Did you have any field work before you entered the Government employ?

A. Not to any extent, except what I did myself in studying geological features.

Q. As a student does? A. Yes, sir; as a student.

Q. No other? A. No other.

Q. And what year, while in the employ of the Government, did you first go into the field—what summer?

A. In the summer of 1893, I think it was.

Q. Where did you go?

A. Into what is known as Owens' Valley, in South-eastern California, was the principal work I did.

Q. How long were you there?

A. About three months.

(Testimony of Fred B. Weeks.)

Q. With a party?

A. Yes, sir; I was with the Director of the Geological Survey and myself.

Q. What were your duties? [685]

A. Assisting the Director in the study of the geological formations of the region.

Q. Who was the director?

A. Charles B. Wolcott.

Q. He was there? A. Yes, sir.

Q. At the time? A. Yes, sir.

Q. What was the formation there?

A. Some igneous rocks; mostly Cambrian strata.

Q. And the next year where did you go—the next summer—in 1904?

Mr. BUDGE.—1894?

Judge DEY.—Yes—1894?

A. I think it was the summer of 1894 that we made surveys in the Black Hills, and the Big Horn mountains of Wyoming.

Q. Underground surveys?

A. I went into some of the mines in the Black Hills.

Q. Underground surveys, were they, or not?

A. Yes, sir.

Q. All of the surveys?

A. All the underground work I did was of that nature.

Q. Well, that is all the surveying you did, I understand you? A. Except what I did on the surface.

Q. Was underground surveys?

A. Not all. What I did on the surface, as well as



(Testimony of Fred B. Weeks.)

what I did underground.

Q. How long were you there? [686]

A. In the Black Hills we were about two weeks, or a little over.

Q. What part did you take in surveying?

A. Going from place to place, and determining the geological formations, and collecting fossils in them.

Q. There was a party of you?

A. The Director of the Geological Survey and myself.

Q. The two of you? A. Yes, sir.

Q. Just the two of you?

A. I think that was all at that time up in the Black Hills.

Q. Well, had any preliminary work been done?

A. Oh, there had work been done there before, yes, sir, and since.

Q. I asked preliminary work. You understand that question, don't you?

A. Yes. There was no preliminary work by myself or the Director, no, sir.

Q. Had the preliminary work been prepared at the time the Director went there and you accompanied him? A. No, sir.

Q. How long were you there?

A. I think it was about two weeks.

Q. About two weeks? A. Yes, sir.

Q. That was all you were out that summer?

A. Oh, no.

Q. Where next? [687]

(Testimony of Fred B. Weeks.)

A. In the Big Horn mountains of Wyoming.

Q. What did you do there?

A. Studying the formations of the Big Horn mountains.

Q. With the Director?

A. Yes, sir, and Mr. Henry Gannett.

Q. And every summer season you went out with somebody, did you?     A. Yes, sir.

Q. With no exceptions?     A. No exceptions.

Q. And did you participate in the Park City survey?     A. Only for three or four days.

Q. How many years ago?

A. I can't be certain of the date, but I think it was 1904.

Q. Seven years ago?     A. Yes, sir.

Q. Is the report out yet?     A. No, sir.

Q. In that survey was investigation made of the phosphate deposit at Park City?     A. No, sir.

Q. At that time no investigation had been made in the phosphate deposits of the West?     A. No, sir.

Q. By the Geological Survey?     A. No, sir.

Q. And when did the Geological Survey first commence making an examination into the Western phosphate deposits? [688]

A. When I made the first examination, in 1906.

Q. In 1906?     A. Yes, sir.

Q. Has the report been got out on that?

A. Yes, sir.

Q. When was that gotten up?

A. In the winter of 1906 and 1907. It was published in 1907.

(Testimony of Fred B. Weeks.)

Q. Who were with you?

A. Mr. Ferrier and Mr. Taylor part of the time, and part of the time I was alone.

Q. The same Mr. Ferrier and Mr. Taylor who have been referred to in this hearing as connected with the San Francisco Chemical Company? A. Yes, sir.

Q. So far as the Government was represented, it was by you? A. Yes, sir.

Q. Now, how do you account for it that seven years have passed with no report upon Park City, and that a report upon the examination made in 1906 of the phosphate deposits was issued in 1907?

A. The notes which I made upon the Park City area were turned over to the Geologist who had charge of the doing of the work there, and as they comprised but a few days they were not extensive.

Q. Who was the Geologist? A. Boutwell.

Q. He made up a report? [689] A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. You had no part in the preparation of it?

A. None whatever.

Q. What were you doing at that time?

A. I was at Park City waiting for the Director of the Geological Survey to come there to take a trip together, and during the few days that I was waiting for him I assisted Mr. Boutwell in his work about Park City.

Q. Now, you understand the question? We were speaking in reference to the report on the phosphate deposit? A. Yes, sir.

Q. Eh?

(Testimony of Fred B. Weeks.)

A. That report I was responsible for, and got out immediately.

Q. Oh, you were.

A. The report on the phosphate in 1906, yes, sir.

Q. Oh. That is the question I was really asking you.

A. Yes, sir. I was personally responsible for that, and wrote it.

Q. Who prepared that? A. I did.

Q. Was it issued as a bulletin? A. Yes, sir.

Q. What— What was it?

A. I don't remember the number of the bulletin.

Mr. BUDGE.—315, I think.

WITNESS.—It can be found here. [690]

(Mr. Budge handed a bulletin to the witness.)

Q. And you were alone in that investigation?

WITNESS.—Bulletin 340.

Judge DEY.—Oh—340?

WITNESS.—Yes— No, this is 1907. It is 1906, is the one I want. That is wrong.

(Mr. Budge handed another bulletin to the witness.)

WITNESS.—The 1906 report is Bulletin 315.

Judge DEY.—Well, I had that right?

WITNESS.—Yes, sir.

Q. Did Mr. Ferrier or Mr. Taylor assist you in the making of the report?

A. Mr. Taylor had no connection with the making of the report. I wrote the report in its entirety and forwarded it to Mr. Ferrier by mail, and he made a few additions in connection with the statement in re-

(Testimony of Fred B. Weeks.)

gard to Montpelier; otherwise the material stood as I wrote it.

Q. Was Mr. Ferrier at that time in the service of the Government, in the Geological Department or otherwise? A. No, sir.

Q. Was he connected with the San Francisco Chemical Company? A. Yes, sir.

Q. And also Mr. Taylor, at that time?

A. Yes, sir.

Q. Does his name appear on the report with you?

A. It does. [691]

Q. How long did you spend making the examination in the summer of 1906?

A. I was about ten days actual field work in the fall.

Q. Did you return again? A. Yes, sir, in 1907.

Q. Who was with you?

A. Mr. Ferrier and Mr. Taylor made some trips with me, and part of the time I worked alone.

Q. There were no other persons there connected with the Geological Survey? A. No, sir.

Q. In 1907? A. No, sir.

Q. Did you get up a report? A. I did.

Q. In conjunction or with anyone?

A. No, sir; that report was written alone and published alone.

Q. Was it sent to Mr. Taylor or Mr. Ferrier before it was issued, like you had done the preceding year?

A. It was sent to Mr. Ferrier.

Q. For revision and correction?



(Testimony of Fred B. Weeks.)

A. If he had any. The fact is that he didn't make any.

Q. When you first visited in 1906 the phosphate deposits, your investigation took in what places?

A. Montpelier.

Q. In the Preuss Range?

A. In the Preuss Range, the Raymond Canyon, and Cokeville [692] in the Sublette Range.

Q. Was the ground then located?

A. Yes, sir, in those places.

Q. Both as lodes and placers? A. No, sir.

Q. Eh?

A. No, sir, not in 1906. They were only located as placers, so far as I know.

Q. So far as you know? A. Yes, sir.

Q. In 1907? A. The same condition existed.

Q. Did you return again?

A. Yes, sir, in the summer of 1909.

Q. Of 1909? A. Yes, sir.

Q. While you were in the service of the Government?

A. Yes, sir. I was in the service of the Land Office that summer—the summer of 1909.

Q. You had left the Geological Survey when?

A. In 1908.

Q. In April, 1908, was it? A. Yes, sir.

Q. At that time was litigation pending in this country over the question of lodes and placers, in reference to the phosphate deposits?

A. I don't think there was any litigation pending in 1908.

(Testimony of Fred B. Weeks.)

Q. At the time you left the service?

A. I don't think so. I didn't know of any. [693]

Q. When were you first employed in connection with the litigation arising over the question of lode or placer locations applicable to phosphate deposits?

A. In January, 1911, with one exception. During the summer of 1909 I was requested by Judge Richards to come down to Boise to consult with him in regard to the phosphate deposits, as he had some litigation on at that time, and I spent a day with him going over the matter.

Q. Were you then in the service of the Government? A. Yes, sir.

Q. Why did you transfer from the Geological Department to the Interior Department?

A. Well, they were both in the Interior Department.

Q. I should say what branch?

A. The Land Office.

Q. The Land Office branch of the Interior Department?

A. The withdrawals of phosphate land had been made in this area, and the Land Office had the determination of whether phosphate occurred upon or underneath a large number of homesteads and other entries that had been made in this country, and it was necessary that examination should be made and reports made upon those claims before passing upon the title, and as I had done all the work at that time that had been done for the Government upon these phosphate deposits, it was considered advisable that

(Testimony of Fred B. Weeks.)

I should assist the Land Office in their work.

Q. It was not on account of an increase of salary?

A. No, sir.

Q. What was your salary while you were in the employ of the Geological Survey? [694]

A. \$2,000.

Q. From the time you went there?

A. Oh, no. No, my salary as \$2,000 was from about the year 1901 or 1902, until I resigned.

Q. Until you resigned?

A. Until I resigned, yes, sir.

Q. Now, you resigned from the Government service when?

A. My resignation from the Land Office was written and forwarded to the Land Office in August, 1910; but at that time they asked that that resignation should be held in abeyance until I had made affidavits, or rather depositions, in regard to a large number of coal cases in Wyoming, and the Chief of Division asked me to let that remain in his hands until those had been disposed of, as he wished to have the record show that I was still a mineral expert for the Land Office, and I did so.

Q. And it remained—

A. It remained in his hands without being accepted.

Q. Until when?

A. Until the— I don't remember the date; it was either at the very close of 1910 or the beginning of 1911 that I sent another letter of resignation directly to the Commissioner of the General Land Office.

(Testimony of Fred B. Weeks.)

Q. I don't care about that especially; I just wanted to know when it was.

A. Yes; it was about that time.

Q. I see. Now, prior to August, 1910, when you resigned, had you done any other private service in connection with the phosphate deposits, or litigation arising over lodes or placer questions?

A. Nothing except what I have mentioned in connection [695] with Judge Richards.

Q. One day? A. Yes, sir.

Q. Eh? A. Yes, sir.

Q. You left the active work for the service when you resigned, didn't you?

A. Well, I left active work some months before. I had left on indefinite leave of absence some months prior to August, 1910.

Q. Not in this country? A. No, sir.

Q. Away from the west?

A. I was in the west all the time, yes, sir.

Q. Oh, you were? A. Yes, sir.

Q. What were you doing while on leave of absence?

A. I was in Nevada, working on some lode claims that I had taken in Western Nevada.

Q. Anything in connection with phosphate?

A. No, sir.

Q. In any way? A. No, sir.

Q. Had your services been secured by Judge Richards in the litigation he had?

A. Only for the time I consulted with him.

Q. Which was one day?

(Testimony of Fred B. Weeks.)

A. Yes, sir, and a day or two that it took me to go to and from Boise. [696]

Q. You have frequently discussed this lode or placer question with Mr. Taylor, have you not?

A. Yes, sir.

Q. From the first time you were out there in 1906?

A. I don't think there was any discussion in regard to lode at that time. There might have been. I don't remember.

Q. And in 1907?

A. I presume there had been some discussion in regard to the former case of Mr. Jones, but I don't remember anything definite in regard to it.

Q. Well, in which of the years was the discussion in reference to Mr. Jones' former case?

A. Well, I couldn't say. It might have been 1906 or 1907, or it might have been both.

Q. What was involved in the Jones controversy?

Mr. BUDGE.—We object to that as immaterial and irrelevant and incompetent, and incumbering the record.

A. As I understood, it was the question of lode or placer locations.

Q. That was then in existence?

A. I think the litigation had been settled before that time, I think so, before 1906, if I remember rightly.

Q. Then, you were mistaken a while ago, were you not, when you stated that there had been no—you had known no cases upon the phosphate deposits at the time of your first visit, in 1906?



(Testimony of Fred B. Weeks.)

A. Yes, I think that's right; I had overlooked these Jones locations. [697]

Q. That is what I was getting around at.

A. Yes, I think you are right. I had overlooked that fact.

Q. I would like you to be reasonably sure upon that point, Mr. Weeks.

A. As to whether discussions had taken place between Mr. Taylor—

Q. As to whether there didn't exist both lode and placer locations upon phosphate deposits when you first went there in 1906?

A. Well, as I remember it the litigation had been settled; so that in 1906 there were no lode locations in existence.

Q. There had been? A. There had been.

Q. There had been?

A. There had been, as I understand it.

Q. As you understood it and talked it over?

A. Yes, sir.

Q. Now, do you remember the Bradley property?

A. Yes, sir.

Q. At the time of the first visit? A. 1907.

Q. You don't remember it until 1907?

A. I wasn't there in 1906, no, sir.

Q. But you were there in 1907? A. Yes, sir.

Q. Was the question of lode or placer spoken about as to that property? A. Yes, sir. [698]

Q. By Mr. Jones?

A. No, sir; I never saw Mr. Jones.

Q. Those claims were contested?

(Testimony of Fred B. Weeks.)

A. I understood a contest was—or an objection was entered to an issuance of patent to the Bradley location.

Q. A protest?      A. A protest.

Q. And a hearing had?      A. Yes, sir.

Q. And they were patented by the Government?

A. Yes, sir.

Q. As lode claims?

A. Yes, sir. I don't know of any hearing being had. I know they were patented as lodes.

Q. Now, in 1909 did you make a report of your investigations?

A. In 1909 I examined about 300 different land entries in the State of Wyoming for the Land Office.

Q. The only question is—

A. And I reported as to each and every one of them as to whether phosphate was upon or underneath such claims.

Q. And that is another number of the Bulletin, is it?

A. No, those were never published; those were simply reports made. And at the end of the season, when I had completed the work, I made a general report to the Commissioner of the General Land Office.

Q. Then, all those reports are not published?

A. No, sir. [699]

Q. Who decides the reports to be published?

A. Usually the—in fact, I suppose, always, the man in charge of the Bureau, like the Director of the Geological Survey, or the Commissioner of the General Land Office.

(Testimony of Fred B. Weeks.)

Q. Did the Director on these trips of his take any other person from the Service with him but you?

A. Occasionally when we were working in the area where some other geologist was working, the geologists of the two parties united for a few days at a time; but no other person was ever called in continuously as an assistant in any of our field work.

Q. Now, will you show me on this yellow exhibit (Defendant's Exhibit 1) where Rock Creek is.

A. It is not noted on the map, but it is about five or six miles east of Sage, Wyoming, which is noted on the map.

Q. What is the scale there?

A. One inch to three miles.

Q. That would be about an inch and a half right east of Sage, as shown on that exhibit?

A. Yes, sir.

Q. When did you make your examination there?

A. I never made any examination of Rock Creek.

Q. Have you been there?

A. No, sir, except as I have gone by it on the railroad. I think I drove along the road by the railroad one time.

Q. The Union Pacific runs along there?

A. The Short Line—the Oregon Short Line.

Q. Oh—from Granger? A. Yes, sir. [700]

Q. So that all you personally know about that is what you have seen from a railroad car, or possibly driving along there? A. Yes, sir.

Q. Who was with you when you drove along?

A. I was alone.

(Testimony of Fred B. Weeks.)

Q. Is there an anticline, or sincline, or monocline?

A. There is an anticline there.

Q. An anticline?

A. Yes, sir. It can be seen from the railroad, or from the wagon road.

Q. And could you see the phosphate outcrop?

A. No, sir.

Q. From the railroad? A. No, sir.

Q. I understood you to say that at that place the dip—the deposit on the dip could be traced for eight miles. Is that right? Do you say that?

A. The question—

Q. Do you say that?

A. No, sir, I don't say that it is so.

Q. How far do you say that at that place the deposit can be traced on its dip?

A. I don't know, of my own knowledge.

Mr. BUDGE.—I think you ought to permit the witness to say what he did say in that connection.

Judge DEY.—Oh, I take it that the record shows what he did say. [701]

Mr. BUDGE.—Well, I think it tends to confuse it.

Judge DEY.—I think I will make it perfectly plain.

Mr. BUDGE.—All right.

Q. You were making your statement yesterday from something you had read? A. Yes, sir.

Q. Before? A. Yes, sir.

Q. And you had no reason from any personal investigation of yours to know whether the statement

(Testimony of Fred B. Weeks.)

you made from some other source is correct or not?

A. No, I have no information.

Q. Then, you don't know whether the country is faulted or not? A. No, sir.

Q. I notice that by the yellow exhibit No. 1 that in some instances—that is an illustration at the top there—that in some instances you have drawn two black lines? A. Yes, sir.

Q. Indicating the upper part or surface showing on the deposit?

A. No, sir. The two black lines indicate that there are two different outcrops of the phosphate.

Q. Two different outcrops? A. Yes, sir.

Q. And it indicates that each of them has a different direction of dip? [702]

A. Yes, sir; the directions of dip differ one from the other.

Q. They dip towards each other?

A. Yes, sir; and on the other side of the anticline they dip away from each other.

Q. Where is the other side?

A. It would be to the east—or, to the west—to the east of the east line, and to the west of the west line.

Q. Well, that's all—

A. The center between the two black lines is a sincline; then the beds raise up to an anticline and dip to the east and west on the sides of the anticline. The same is true at Georgetown, where there are two black lines?

Q. Oh, yes—where in part there are two black lines? A. Yes, sir.



(Testimony of Fred B. Weeks.)

Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?

A. Taken as a vein or lode, along the strike of the bed, following down upon the dip, the lode locator would have a bed as far as it went on that dip.

Judge DEY.—Now, if you will read the question, Mr. Hamer, to the witness.

(The last question was repeated, as follows:)

“Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?

[703]

A. It is important as indicating how much of the bed would be included upon a lode claim.

Q. I ask you in the determination of the question of whether they were lodes or veins or not?

(At the request of the witness said last two questions were repeated, as follows:)

“Q. Of what importance, in determining the question of the location of these deposits as veins or lodes or otherwise, is it in your opinion, the extent on the dip—the extent thereof on the dip?”

“Q. I ask you in the determination of the question of whether they were lodes or veins or not?”

A. I don't know that that is of any particular importance.

Q. You can't think of any?      A. No, sir.

(Testimony of Fred B. Weeks.)

Q. In your visit at Park City, you discovered that there were igneous rocks in that district?

A. Yes, sir.

Q. And at other places in this entire section you have covered by the yellow exhibit No. 1?

A. Well, the exhibit No. 1, there are no igneous rocks within the areas which are marked as green. In the areas in which there are no markings, there are some igneous rocks.

Q. Well, the body of it is yellow? A. Yes, sir.

Q. As I see it? [704]

A. Yes; there are in the yellow area some igneous rocks.

Q. There is a hot springs not far from the Montpelier property, isn't there?

A. Yes, sir; near the north end of Bear Lake.

Q. Is there any phosphoric acid in the water?

A. I couldn't say. I never examined it. I don't know that it has been examined for that.

Q. Didn't it occur to you to make an examination for that purpose?

A. No, sir. I visited the hot springs. I didn't consider that they had any relation whatever to the phosphate beds.

Q. How far distant from the phosphate beds shown on Exhibit 2 is that, Mr. Budge?

Mr. BUDGE.—Exhibit 1?

Mr. DEY.—Well, not the yellow one.

Mr. BUDGE.—On this? (Indicating Defendant's Exhibit 2.)

Mr. DEY.—Yes.

(Testimony of Fred B. Weeks.)

Mr. BUDGE.—Exhibit 2?

Mr. DEY.—Exhibit 2.

Mr. BUDGE.—I should say it was 12 to 16 miles in a southerly direction from the Montpelier deposits.

Q. Now, is the spring to the west of the phosphate deposits?

A. At the hot springs locality, it is, yes, sir.

Q. Then the phosphate deposit on its dip would be under these hot springs?

A. Yes; it would be at considerable depth under.

[705]

Q. And what does a boiling hot springs indicate to your mind, as a geologist?

A. There must be conditions of extreme heat underneath the surface, with which the hot springs has connection.

Q. That the waters come from below?

A. Yes, sir.

Q. And are forced up? A. Yes, sir.

Q. And go through this bed of phosphate—pass through?

A. I think not, at that locality. I think that between the phosphate bed and the springs there is a fault, which displaces the strata several hundred feet, bringing the phosphate up to the surface; and that if the waters of the hot springs penetrate the phosphate bed it must be at a depth of a few thousand feet.

Q. Yes. What evidence have you found of a fault?

A. The beds are displaced, and the beds which now

(Testimony of Fred B. Weeks.)

occupy the surface upon one side of the fault are of a different character and of a different age than those which are found on the west side of the fault.

Q. Did you mean to be understood as saying that underlying the area of 300 by 500 miles that phosphates would be found—phosphate deposits?

A. Except in those places where it has been brought to the surface and eroded, there would be.

Q. That is your opinion?      A. Yes, sir.

Q. That is simply a matter of opinion, isn't it? It has never been demonstrated, has it?

A. Not as a demonstrated fact. It is a conclusion drawn [706] from the observations as you find them.

Q. Your own conclusion, eh?

A. That is what I am passing my opinion on, is my own observations. That is my conclusion, from my own observations.

Q. From your own observations?

A. Yes, sir.

Q. But you will except the hot springs locality?

A. It is underneath the surface there.

Q. I understand that. It is underneath the surface everywhere, except where it outcrops, isn't it?

A. Except where it outcrops, or where it has been eroded.

Q. Then you except the hot springs locality?

A. In what respect do I except it? I don't understand you.

Q. As not containing the deposit of phosphate?

A. The phosphate is there. Simply its position is

(Testimony of Fred B. Weeks.)

changed by this fault.

Q. Now, is there a copper deposit in the locality of Montpelier, or these claims near Montpelier?

A. There are some copper deposits three or four miles east of the Montpelier phosphate beds.

Q. Do you know how that copper got in the form and position it is found there?

A. No, sir.

Q. You don't?      A. No, sir.

Q. How does that happen?

A. I haven't made any study of it, for one reason.

[707]

Q. Are you able to say whether it came by metasomatic action?      A. No, I could not.

Q. Or leaching?      A. No, sir.

Q. Or from ascending or descending waters?

A. No, sir.

Q. Is it found in the sedimentary deposit—formation?

A. I think so, because in passing along the road I have never seen anything but sedimentary deposits in that locality.

Q. Wouldn't the investigation of that have been of interest in the solution of the problem you have been trying to solve up there?

A. Not in relation to the phosphate problem—I don't see that it had any connection.

Q. Was that copper deposit formed before the present uplifting and folding of the country?

A. I couldn't say, for I never examined it.

Q. You don't know anything about it?



(Testimony of Fred B. Weeks.)

A. No, sir.

Q. You have visited the phosphate beds or deposit at Park City, you say? A. No, sir.

Q. You don't know, then, how valuable it is?

A. No, sir.

Q. Or whether it is of any value? A. No, sir.

Q. Some of them are of no commercial value?

A. Yes, sir; a great deal of it is of no commercial value— [708] under present conditions.

Q. It is the combination of phosphoric acid and tricalcic, or lime, that gives it commercial value, is it not? A. Yes, sir.

Q. Without that union or combination these deposits in question would not have a commercial value? A. No, sir.

Q. And that combination of the mineral is in the Encyclopedia Britannica under Phosphorite, is it not?

A. I don't think so. It is the chemical compound of calcium phosphate and phosphoric acid—it should be.

Q. Isn't there such a thing known as metallic phosphorus?

A. I don't know of any such a thing.

Q. You never heard of it?

A. I don't recall it.

Q. I call your attention to the Encyclopedia Britannica, Volume 18, Edition of 1898, page 817, which I wish you would look at, and then answer the question if there is any such a thing known as metallic phosphorus?

(Testimony of Fred B. Weeks.)

(The witness examined the same.)

A. I have never seen this statement before, but—

Q. You find it there, do you? A. Yes, sir.

Q. You find it there? A. Yes, sir.

Q. What is phosphorites?

A. The plural of phosphorite?

Q. Phosphorite?—phosphorite? [709]

A. Why, it is a crystalline variety of the mineral apatite, of fibrous structure, containing chlorine.

Q. I read you this short definition from page 818 of this same work: “Phosphorite is the name given to many impure forms of amorphous or massive apatite, modified more or less by disintegration. It occurs in massive, irregular, corroded looking nodules embedded in limestone or other kind of soft rock, near Amberg.”

A. I think that is an absolutely incorrect definition of phosphorite.

Q. You don't understand from your testimony given yesterday phosphorite to mean what I have just read?

A. No, sir, I don't understand it to mean that.

Q. What is phosphor bronze?

A. I don't know.

Q. You have never heard of that, have you?

A. Oh, I have heard it, but I don't know it.

Q. This encyclopedia, at page 817, under that heading, says: “This name has been given to a class of useful metallic substances produced by the chemical union of either pure copper or of copper alloys with phosphorous.” That is entirely new to you?

(Testimony of Fred B. Weeks.)

A. I think so. I don't recall it under that name.

Q. I will ask you what is meant by the chemical formula,  $P_2 O_5$ ? A. Phosphoric acid.

Q. And what?

A. Phosphoric acid. That is the chemical formula for phosphoric acid. [710]

Q.  $P_2 O_5$ ? A. Yes, sir.

Q. That means two parts—

A. —of phosphorous—

Q. —and five of— A. —of oxygen.

Q. Now, you have testified about the uses and the use of this material found in these deposits?

A. Yes, sir.

Q. When did you visit the factories?

A. On June 15th, 1911.

Q. Where? A. At Martinez, California.

Q. Well, whose building?

A. The factory of the San Francisco Chemical Company.

Q. I read you now from page 815 of the same encyclopedia, under the heading, "Manufacture": "For the manufacture of ordinary phosphorous any kind of phosphate of lime might be used, and in fact mineral phosphates are used occasionally." Is that the fact, as you understand it?

A. Yes, sir, as I understand it.

Q. "Although bones are often resorted to"?

A. Yes, sir.

Q. This deposit could be used in that way?

A. I think so.

Q. You really know that, don't you?

(Testimony of Fred B. Weeks.)

(No answer.)

Q. You really know that?

A. That it could be used? [711]

Q. Yes? A. Oh, yes.

Q. Now, the use is in some of the arts and industries, and in the medica materia? A. Yes, sir.

Q. Now, one matter I couldn't understand yesterday, if you will make it clear to me—I am almost through—you made a statement—(if I am not stating it correctly, correct me)—you made a statement to the effect that in the condition it is found it would be more valuable for use as a fertilizer without the treatment at the mill?

A. Under the conditions which I named in my testimony.

Q. Oh—that was limited?

A. Yes, sir, it was limited.

Q. To certain conditions? A. Yes, sir.

Q. We will come to that. Do you know what the price paid for the prepared product of the mill is per ton?

A. I don't know what is paid in California; I know what I have paid for it in the Eastern States.

Q. Do you know whether it is not more than paid for the crude? A. Oh, yes.

Q. Several times more?

A. Well, I couldn't agree to that.

Q. Well, do you know?

A. No, I don't know.

Q. You could not state whether or not it was not four times the price of the crude material? [712]

(Testimony of Fred B. Weeks.)

A. Oh, no.

Q. Now, what was the exception or qualification which you placed upon it—just briefly?

A. That in using the raw rock, the soil should contain a considerable proportion of humus, either naturally or put into it in the shape of manure, or plowing in green manures.

Q. Then, for soil of other descriptions, the other prepared articles would be better? A. Yes, sir.

Q. You were referring to the present use made of phosphates through this territory? A. Yes, sir.

Q. In your testimony yesterday, by that you didn't, I take it, intend to say that no other uses might hereafter be made from that deposit?

A. No, sir, I didn't intend that.

(At this time the witness was temporarily excused.) [713]

**[Testimony of C. L. Breger, for Defendant.]**

C. L. BREGER, a witness called in behalf of the defendant, being first duly sworn testified as follows, to wit:

**Direct Examination.**

(By Mr. BUDGE.)

Q. What is your name? A. C. L. Breger.

Q. Where do you reside? A. Chicago, Illinois.

Q. And what is your occupation?

A. I am Associate Editor of the Mining World, a weekly periodical devoted to mining, metallurgy, and allied industries.

Q. How long have you been Assistant Editor—

A. Associate Editor.



(Testimony of C. L. Breger.)

Q. Associate Editor of the Mining World?

A. Since December, 1910.

Q. Prior to December, 1910, in what work were you engaged, Mr. Breger?

A. On the Geological Survey, and—

Q. The United States Geological Survey?

A. The United States Geological Survey.

Q. And for what period of time?

A. Practically from 1903 until I severed my connection with the Survey.

Q. From 1903?

A. Yes; intermittently between 1903 and 1905, and practically continuously since 1905.

Q. Now, covering the entire period of your connection [714] with the United States Geological Survey, what were your duties?

A. My duties with the Geological Survey were to examine the geological structure of the various districts to which I was assigned, with particular reference to delineating rock formations, and particularly by their fossils.

Q. What preparation had you in geology and mineralogy prior to your connection with the Survey?

A. I had studied elementary mineralogy, geology, and physical geography in the boys' high school at Brooklyn, New York, and I took more advanced courses at Cornell University from 1901 until 1906; I took the Summer School of Field Geology in the Helderberg Mountains in Albany County and through Central New York; and during the winter of 1903 and 1904 I was temporarily employed by the Indiana

(Testimony of C. L. Breger.)

Geological Survey, and stationed at Yale—Yale University, in New Haven, Connecticut.

Q. Did you specialize in the study of geology in Cornell?

A. Yes; practically three-fourths of my work was in geology, or geological subjects.

Q. And mineralogy?

A. Not to any great extent.

Q. You took the courses given there?

A. Yes; but I didn't specialize in mineralogy.

Q. Beginning with your service with the Geological Survey, where did you operate—in what part of the United States?

A. In 1903, 1904, 1905, 1906 and 1907—no, I will cut off the 1907—in 1903, 1904, 1905 and 1906 I was in South Central New York, in the areas covered by the Ithaca, Watkins, Elmira, Waverly and Catatouk quadrinals, in South Central New York, and in adjoining portions. [715]

Q. In 1907, 1908, 1909 and 1910 where were you?

A. In 1907 and 1908 I was working in Maine, with a few side trips into New Brunswick.

Q. In 1909 and 1910?

A. In 1909 and 1910 I was in Idaho, Utah and Wyoming, on the phosphate work.

Q. Were you also connected with the Geological Survey at that time? A. Yes.

Q. How long were you engaged in field work in 1909 and 1910, in the phosphate fields?

A. In 1910 I was engaged during all of June, the last week of May, all of June, July, August, Septem-

(Testimony of C. L. Breger.)

ber, and part of October.

Q. What part of 1909? A. That was 1909.

Q. That was in 1909? A. Yes.

Q. In 1910 how long were you engaged in the field work, in the phosphate work?

A. All of July, August and September, or most of September.

Q. Give us in brief a statement of the field covered and visited by you and the area covered by your investigation in the Geological Survey, of the phosphate field in 1909 and 1910.

A. In 1909 I examined personally the phosphate from Georgetown northward to Deer Creek, and beyond Deer Creek.

Q. Where is Deer Creek? [716]

A. It is a little canyon at the north end of the ridge coming down from Preuss Peak, about six miles north of Preuss Peak. And I also examined the deposits about Montpelier, extending upward into Gertch Hollow, and Home Canyon, and the geology of the country from Montpelier southward, practically continuously to beyond the south end of Bear Lake, on the east side of Bear Lake Valley; also the geology of the country south and southwest of Bear Lake, although we did not find phosphate in the immediate vicinity of Bear Lake. Then, we examined the phosphate occurrences in Raymond Canyon and northward. I examined the phosphate occurrences in Raymond Canyon and northward, and the geology of the Sublette Mountains as far as a few miles north of Green's Ranch, where the Thomas Fork comes

(Testimony of C. L. Breger.)

down from the east, which is I should say about 15 or 18 miles north of Raymond Canyon. We also examined the geology south of Raymond Canyon, throughout the extent of the Sublette region, as far as Cokeville, Wyoming; and we also examined the geology on the west side of Thomas' Fork Valley, although there was no phosphate occurring there in the carboniferous. The party examined the phosphate—

Q. Were you with it?

A. —at Spine Cup; but I wasn't with it at Spine Cup; but I took up the party again in the Crawford Mountains, where I examined the phosphate and associated geology of the Beckwith Hills, embracing the group of claims owned by the Union Phosphate Company, I believe, and the main part of the phosphate area of the Crawford Mountains, extending from the vicinity of I think it is the Bradley Brothers southward to Rex Peak and a little [717] distance beyond. That is the highest peak of the Sublette Range. Also in 1909 I examined the phosphate and associated geology at Twelve Mile Creek, southwest of Woodruff, Utah.

Q. Now, in 1910 what part of the phosphate area did you cover?

A. Shall I finish answering 1909 first?

Q. Yes—go ahead.

A. In 1909 I was also handed some specimens of phosphate from the divide between Hams Fork and Fontenelle. Those samples I did not myself collect, but received on reliable authority, and they were sub-

(Testimony of C. L. Breger.)

mitted for analyses, and showed over 70% calcium phosphate.

Q. Go ahead and tell us what you did.

A. In 1909 I examined the phosphate and associated geology in Montpelier, in Afton Canyon. We searched for the phosphate in Roney Creek, in the Snake River Range, near Blowout postoffice, but found that the phosphate horizon was there cut out by a fault. I picked up the phosphate in Pine Creek, northeast of Irwin, Idaho, and examined the phosphate and associated geology thereabouts. Also at Teton Pass.

Q. What county in Idaho?

A. I believe it is.

Q. Fremont?

A. I don't know what county it is in, but it is at the south end of the Teton Range, on the pass between Jackson Hole and Teton Basin, including St. Anthony, Driggs, and a lot of towns. Also found the phosphate and examined the phosphate section and associated geology in Moose Canyon, in Coal Canyon,— [718]

Q. Where are these canyons, Mr. Breger?

A. —and Darby Canyon. On the west side of the Teton Range, northeast of the Teton Basin, and traced the phosphate horizon and associated geology from Teton Pass practically as far as the town of Alta, which is on the Idaho-Wyoming line. I also found the phosphate, and examined it and the associated geology, on Phillips Ridge, near Wilson, Wyoming. We next went to Hoback Canyon, south



(Testimony of C. L. Breger.)

of Jackson Hole, and examined the phosphate and associated geology south of Hoback Canyon, and north of Hoback Canyon, including Astoria Mountain and the country around Johnson Creek, or Horse Creek. We also examined the phosphate and associated geology opposite Count's ranch, at the upper head of the Snake River Canyon, two or three miles below Hoback Canyon. This, by the way, is a locality which is indicated on the Land Office plats as a coal prospect, and various localities in the Teton Range were also indicated in old geological survey reports as probably coal prospects, which first attracted our attention to these areas as possible phosphate fields. From Hoback Canyon we passed north into the Grovont—

Q. Is this all in Wyoming, Mr. Breger?

A. All in Wyoming. —Grovont or Grosventre River and Basin, and examined the phosphate and associated geology about the Grovont Canyon, from the vicinity of its mouth up to and along Crystal Creek, a distance I should say of seven or eight miles, and a similar distance up Crystal Creek. Also we examined—I examined the phosphate and associated geology on the west slope of Sheep Mountain, and in the low foothills on the [719] west of the Grovont Range, opening on Jackson Hole. We also examined the associated geology of the Park City beds in the lower buttes—the lower Grovont buttes in Jackson Hole, near the city of Jackson, and found the limestone underlying the phosphate, but the position of the phosphate was there occupied by andesitic

(Testimony of C. L. Breger.)

lava flows, and the phosphate though originally present had been eroded and removed, and its place covered with outflows of lava. From Grovont I examined the phosphate and associated geology along the Buffalo Fork of the Snake River, south of Yellowstone Park, along the North Fork of the Buffalo Fork,—

Judge DEY.—Is the object of this to qualify the witness?

Mr. BUDGE.—Yes, that is one object of it, and another object, I think, is to show the extent of the deposit.

Judge DEY.—Oh.

A. From within a few miles of Yellowstone Park, extending around Black Rock Creek to the pass—to near the pass between Black Rock Creek and Buffalo Fork and the Wind River Basin. I examined the phosphate and associated geology along the head of the Grovont River about Darwin, Wyoming, and between this point and Wells, and along the region of Elk Creek, and a portion of the east slope of the Grovont Mountain range. I also examined the phosphate and geology of the Wind River Range, along the east side of said range, extending from Union north to Lander, a distance of about sixty miles. Along the range the phosphates in the Park City bed are easily and plainly discernible, [720] forming a deep slope along the foothills of the range, visible as a continuous, inclined sheet or plane for a distance of fifteen or twenty miles, as far as the eye could see, along almost in part of the base of the Wind River

(Testimony of C. L. Breger.)

Range. I also examined the phosphate and associated geology north of the Wind River Valley, along the Horse or Pony Creek, near Mr. Brent's ranch, about ten or twelve miles north of Circle, Wyoming. I also examined from the maps the geology of the country in the Owl Creek Mountains, and predicated the existence of phosphate therein, and applied for a special assignment to investigate those deposits, but was refused, and Mr. Blackwelder instead examined these deposits about Thermopolis, and found the phosphate where I had expected it would appear. In 1909 I also examined specimens of the phosphate which had been collected in 1906 and 1907 by the Geological Survey, particularly by Mr. Schultz and by Mr. Smith,—

Q. Which Mr. Smith is it?

A. I don't know his initials. —at Absaroka Ridge, in West Central Wyoming. In 1910 I also examined in the office the specimens of phosphate rock collected by H. S. Gale from near Melrose, southwest of Butte—southerly—from Butte, Montana.

Q. Now, Mr. Breger, what is the approximate length and width of the area covered by you, as you have just detailed it?

A. I can tell that better from a little map.

Q. How is that?

A. I can tell that more accurately from a little map than any guesses I could make.

Q. Well, just approximately. [721]

A. Practically the entire length of the State of Wyoming—the west half of the width; the eastern

(Testimony of C. L. Breger.)

part of the State of Idaho; the southwestern part of the State of Montana; the northeastern part of Utah.

Q. About how many miles one way and another is it?

A. Well, I don't know that, I would just have to guess at it; but I could tell very accurately from the maps.

Q. Well, is it 300 or 400 miles one way or another?

A. All of that; yes, sir.

Q. Which way? A. Both ways.

Judge DEY.—Q. Any way?

Mr. BUDGE.—Q. Any way?

A. Yes.

Q. Now, Mr. Breger, have you examined the phosphate deposits of Montpelier—near Montpelier—and what is known as the Raymond and Francis placer claims of the San Francisco Chemical Company, in Raymond Canyon, at any other time than in 1909?

A. I examined the claims about Montpelier in 1911, in the latter part of June—a few days ago—

Q. A few days ago?

A. A few days ago,—and the Raymond placer claim, north of Montpelier—north of the Raymond Canyon, I believe, and the Francis claim, a few miles south of the Raymond Canyon.

Q. Now, calling your attention to the question of the [722] formation as it exists upon all these claims which are in question in these suits, how does it compare with the formation of the phosphate deposits which you found elsewhere, within this area over which you operated on the Geological Survey?

(Testimony of C. L. Breger.)

A. The phosphate in the Montpelier region and along the west banks of the Sublette Range occurs in the same formation and within the same very limited horizon, and it is an integral and inseparable portion of the entire phosphate field, part of which has been included in the limits within which I have examined it, and so far as there is any separation of the Montpelier or Sublette area from the entire phosphate field this is due entirely to the accident of erosion and the recurrence of intervening mountain ranges with older rocks.

Q. Now, what is the stratification as it is shown, where this phosphate rock is exposed, throughout this region? Tell us what underlies and what overlies it.

Judge DEY.—Do you think it is necessary? Is there any difference between us on that?

Mr. BUDGE.—Well, I don't think there is any particular difference.

Judge DEY.—Well, I just make that suggestion.

Mr. BUDGE.—Q. Well, I will ask you this—I will withdraw that at this time—Did you hear the statement of Mr. Weeks as to the nature of this formation? A. Why, I heard it.

Q. And of the underlying bed and overlying bed?  
[723] A. Yes.

Q. Of this phosphate? A. Yes, sir.

Q. And is that practically correct?

A. In its essential features it is correct, throughout the field I have examined it, except with a few differences as to greater or less thicknesses of the



(Testimony of C. L. Breger.)

different members of the Park City formation; but there is throughout, the overlying chert member—the phosphate shale member and underlying limestone—more or less sandy or silicious, locally.

Q. Showing you Defendant's Exhibit 4, would you call that a correct representation or a typical representation of the outcrop of these phosphate beds throughout this entire area?

Q. As to the typical representation, in so far as the phosphate beds are distinctly stratified—distinctly bedded—the main phosphate bed occurs at the base of the shale series overlying the underlying limestone.

Q. Well, this exhibit shows what would—what is a typical showing of what would appear throughout this entire region, if you should take a cross section of the stratification in which these phosphate beds appear?

A. Yes, varying in this one particular; that the limestone band which overlies the main phosphate bed and extends continuously from the region of Georgetown to south of Montpelier, has not been recognized as such elsewhere—which is a minor point.

Q. Well, that is essentially correct, however?

A. Yes, sir. [724]

Q. Throughout this area that you have visited, are there any places where a considerable portion of this valuable bed or underlying bed of phosphate rock appears near the surface, to make it impracticable to mine it underground?

(Testimony of C. L. Breger.)

A. Where I have examined the phosphate along the—wherever the phosphate forms deep slopes—what are known as deep slopes along the surface, there are usually fairly extensive areas in which the phosphate can be quarried, or stripped from the surface; but for the most part the phosphate must be mined as a bed of coal would be mined.

Q. Then, I am to understand you, am I, that the mining of this phosphate would depend in a measure upon the particular locality from which you desire to take the deposit?      A. Yes, entirely so.

Q. Have you inspected the workings which have been made upon this deposit in sections of the country in different localities?

A. I have examined the workings which have been made in all the various fields, and have in addition made workings of our own, to lay bare the phosphate bed when there was any question as to its presence in certain areas examined.

Q. Now, where you say these dip slopes occur, and where you say considerable areas would be mined by an open quarry, would it be practicable to mine the phosphate rock in any other manner than by open quarry?

A. It would be impossible.

Q. How long were you upon the ground included within the area shown by Defendant's Exhibit 2 and Plaintiffs' Exhibit 1, when you made your examination in 1911? [725]

A. Parts of one day and part of another, in 1911;

(Testimony of C. L. Breger.)

but much of the examination I had previously made in 1909.

Q. In whose company were you, in making the examination in 1911?

A. Part of the time with Mr. Weeks—part of the time with Mr. Weeks and with Mr. Bell, and part of the time with Mr. Taylor.

Q. Calling your attention to the Defendant's Exhibit 2, I will ask you if when you were upon this ground in 1911—that is, this month—whether you familiarized yourself with the corners and lines of the lode claims shown thereon?

A. With all the essential corners, yes—not with every individual one.

Q. And with reference to the side lines and end lines of these various lode claims, did you make any examination to determine the position of the outcrop of the deposit?

A. Yes; I went over the ground with that map, and at the important or crucial points I examined the corners and their corresponding indication on the map; also determined whether the outcrop as mapped had been properly mapped, and found it had with one or two exceptions, and those I believe have since been corrected.

Q. Calling your attention to the black line which appears on Defendant's Exhibit 2, I will ask you whether or not from your examination of this outcrop which you made in 1911, whether that black line correctly represents the outcrop as it appears within the boundary lines of the placer and lode

(Testimony of C. L. Breger.)

claims shown thereon?

A. Yes, with one proviso, of course; that the phosphate [726] outcrop, as you usually term it, I would rather qualify that, that it does not outcrop everywhere along the point; but this represents the line along which the phosphate bed emerges along the overlying stratum as practically the apex of such line.

Q. In other words, that line represents the highest points on these claims at which phosphate is discernible?

A. Not only that, but also lower points where such phosphate emerges from capping in the canyons and gulches along the dips.

Q. Such as on the Mount Pleasant lode?

A. Such as on the Mount Pleasant lode, and near the Tennessee lode.

Q. Calling your attention particularly to the Arkansas lode and the Mount Pleasant lode, I will ask you to describe the manner in which this phosphate bed is exposed.

A. The phosphate bed is exposed in some tunnels and cuts on the north side of a little gulch south of the Arkansas lode, and within the south line of the Arkansas lode, and follows along the line essentially as indicated on this exhibit, Defendant's Exhibit 2. It does not reach the north end line of the Arkansas lode, which north end line is in the vicinity of a shallow gulch, down which the line of emergence extends into the Mount Pleasant lode. The line of emergence of the phosphate bed then rises on the

(Testimony of C. L. Breger.)

north side of this little gulch to the south side of a deep rocky escarpment formed by the underlying limestone, which is a couple of hundred feet north of the north line of the Arkansas lode. This escarpment is in the underlying limestone, and north of this escarpment; the phosphate does not occur on the southeast side—does not outcrop on the southeast side of Montpelier Creek. [727]

Q. Now, calling your attention— A. Then—

Q. Well, go ahead.

A. Then, from this little rocky escarpment, which holds up the little dip slope, so to speak, of the phosphate, the phosphate bed extends southwesterly along a steep slope within the limits of the Mount Pleasant lode, essentially as indicated on Defendant's Exhibit 2.

Q. Now, is the Arkansas higher or lower than the Mount Pleasant?

A. The Arkansas is higher than the Mount Pleasant lode.

Q. And in which direction does the phosphate bed dip from the Mount Pleasant lode—from the outcrop on the Mount Pleasant?

A. From the outcrop on the Mount Pleasant the phosphate does not dip downward any way.

Q. Which way does it extend?

A. It extends upward.

Q. Towards what claim?

A. Towards the Arkansas.

At this time an adjournment was taken until tomorrow morning at 9:30 o'clock. [728]



(Testimony of C. L. Breger.)

On Friday, the 23d day of June, A. D. 1911, at 9:30 o'clock A. M., the hearing was resumed, pursuant to adjournment.

C. L. BREGER, a witness heretofore called by the defendant and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. From your examination of this phosphate area which you have described, how far on the dip has it been determined that this phosphate bed extends?

A. The phosphate bed extends on the dip as does any coal bed, and even where it plunges beneath the overlying strata, like a coal bed that might be and could be found by boring, and comes out again where the strata are uplifted and reappears on opposite sides of sinclines and at opposite sides of anticlines. It has, in fact, been folded—actually folded on dip slopes, in the north side of the Grovont Range—

Q. In what state, Mr. Breger?

A. In Wyoming, west of Crystal Creek, and between Crystal Creek and Sheep Mountain, the Park City beds, including the phosphate, extends as a continuous slope down the northeast side of Sheep Mountain into the Grovont River, for a distance [729] of about four miles, where they form the surface rocks before they dip under what are known as the Red Beds.

Judge DEY.—I move to strike that out as not responsive to the question asked, and not relevant or pertinent to the ground in question.

(Testimony of C. L. Breger.)

Q. Now, is that— A. There are other cases.

Q. Well, has it been known to dip—to extend on the dip any farther than four miles in any other place? If so, where?

A. Yes; it extends farther than four miles here, because at the distance of the four miles mentioned it is covered by the Red Beds, and when the Red Beds come in the phosphate is then about 400 feet below the surface.

Q. Has that ever been demonstrated?

A. Yes, sir, by stratigraphic geology. Above the phosphate horizon known as the Park City formation there occurs throughout the west a series of beds known as the Woodside and Thayne's formations, which are of Permian and Triassic age.

Q. Well, just limit your answer to the place where it extends and how it has been demonstrated.

A. Yes. The Woodside formation which overlies the Park City is in the region of Jackson Hole and eastward between 150 and 300 feet thick, and is followed by the Red Beds; so that where the Red Beds are observed the phosphate rock is at a corresponding depth, plus from 25 to 75 feet thickness, to include the chert and shales overlying the main phosphate bed. So that at Red Mountain, in the Red Hills north of the Grovont River, [730] where the Red Beds first appear, the phosphate is at a depth of less than 400 feet, or about 400 feet, and the dip northwestward is maintained for four or five miles or more still farther.

Q. Beyond the river?

(Testimony of C. L. Breger.)

A. In a continuous direction down from the dip slope. The first four or five miles mentioned down the dip slope represents what is known as a dip slope; that is, the mountain—

Q. Well, never mind that, Mr. Breger. I just want to find out the extent of the deposit on the dip, without these other details in some particular place.

A. It would be eight miles or more at the Grovont.

Q. And has that been demonstrated?

A. Absolutely. Then, in the Wind River Range, on the northeast side of the Wind River Range, and on the southwest side of the Wind River Valley, for a distance of about 90 miles the phosphate forms a continuous slope, which may be traced on the surface. The Park City beds form a continuous dip slope which may be traced on the surface for from half a mile to a mile and a quarter or a mile and a half, beyond which distance—

Q. You mean a mile and a quarter or a mile and a half in width?

A. No—down the dip slope—beyond which distance the overlying Red Beds, in which the strata appear conformably, continue the same northeastward dip. So that along a continuous northeastward dip through a distance of 90 miles or more, the phosphate maintains a uniformly northeastward dip down a distance of seven or eight miles; throughout nearly all of which extent it could be mined and extracted. [731]

Q. Now, Mr. Breger,—

(Testimony of C. L. Breger.)

A. Then, there are also other points; but these are among the most important.

Q. Mr. Breger, are you familiar with the deposits of gypsum? A. Yes.

Q. In what states? A. In New York state.

Q. Any other place?

A. Not that I know of, offhand, now.

Q. How do they occur—these deposits?

A. Deposits of gypsum in New York State, do you mean?

Q. Yes. A. Or gypsum anywhere?

Q. Well, in New York State?

A. The deposits of gypsum of New York State occur as interstratified beds, deposits, and along with the underlying and overlying strata, in a series of gypsiferous shales, in the Silurian, and are overlain by a fossiliferous, hard limestone band, which in New York State is known as the Cobleskil limestone, and in Pennsylvania is known as the bastard limestone.

Q. Now, what is the extent of these deposits there?

A. The gypsum deposits extend throughout the Salina formation as interstratified, bedded, original deposits, from beyond the western boundaries of New York, through Central New York, in an east and west direction, into Albany County; then bend southwestward into Pennsylvania; and from the outcrop in Central New York the beds dip southerly into Pennsylvania; and in central and northwestern points the gypsum beds again emerge [732] in a sincline.

(Testimony of C. L. Breger.)

Q. Now, how do they occur in physical appearance as compared with this phosphate deposit?

A. The gypsum beds of New York resemble very closely in color the phosphate beds, as being black, gypsiferous shales, although the main gypsum beds vary in color from black to creamy pink or white in different parts of the field; but where I examined the gypsum at northeast of Union Springs, at one of the largest gypsum quarrying regions in the State, the gypsum was black, and the gypsiferous shales were black.

Q. Well, has it a dip and a strike?

A. It has a dip and a strike, which is maintained for long distances.

Q. How is it, compared with this phosphate rock?

A. In practically the same way.

Q. And how is it mined?

A. It is mined in open quarries. It is mined for the entire output of the gypsum bed. There is no gangue matter with the gypsum, nor is there any metallic mineral or any metal for which the gypsum is mined.

Q. What is it used for?

A. Gypsum is used—in the old days it was used exclusively for what is known as lime plaster, or fertilizer, or manure, and it is now still used largely for that, but to a large extent in the calsomining industries, and as plaster of paris.

Q. Is it used commercially from these quarries for fertilizer purposes? A. Yes. [733]



(Testimony of C. L. Breger.)

Q. And is it mined in any other method than by quarries?

A. It happens that in New York State the beds are mined along the outcrop, because such mining is more economical and can compete to better advantage than underground mines. So that all mines are located along the outcrop, and are mined as quarries.

Q. What are the chemical constituents of gypsum?

A. Calcium sulphate. The formula  $\text{SO}_4$ , with some amount of combined matter.

Q. What is the metal base, or has it a metal base?

A. The base of gypsum is calcium.

Q. And the nonmetalliferous mineral is?

A. Sulphur and oxygen.

Q. And what is phosphorite, Mr. Breger?

A. Phosphorite is—was originally a broad and loosely used—has been a broad and loosely used word; but in the origin of the meaning and in the meaning in which it is used by competent and proper authorities, it is—the name phosphorite is applied to a mineral and similar minerals which originally came from the Province of Estremadura and Cáceres, in Spain, and similar deposits in Nassau, Western Germany, and in Southern France, all of which are distinctly crystalline minerals; they are not amorphous rock phosphate, or phosphate rock deposits, and as minerals have distinct and uniform chemical composition and physical properties, among the most important of which is a fibrous or radiating structure, and the occurrence of the phosphorite in

(Testimony of C. L. Breger.)

balls varying from the size of a large pea, or hickory nut, to the size of the fist, or in exceptional cases to the size of a cabbage. [734]

Q. I will ask you: Is this calcium phosphate, phosphorite?     A. Most decidedly, no.

Q. And in what respects does it differ from phosphorite?

A. In the first place, the phosphate in these deposits is a rock, rather than a true simple mineral such as phosphorite. It lacks the uniform Chlorine content, which is one of the characteristics of phosphorite. It has a concentric oolitic structure, which is distinct from that characteristic of phosphorite; and the geological associations are totally distinct between phosphorite deposits and deposits of phosphate rock, or rock phosphate, such as these in question.

Q. Calling your attention to phosphorite, has it a given density, or gravity?     A. Yes.

Q. And in that respect is it distinct from calcium phosphate?     A. To a certain extent, yes.

Q. Has it a given luster?

A. The luster varies more or less.

Q. The luster varies more or less—

A. —with phosphorite.

Q. But it is fibrous, you say?

A. It has a distinctly mineral—it is a distinct mineral, one of the most persistent characteristics of which is a fibrous, radiating structure.

Q. Are there any deposits of phosphorite in the United States, known to geologists?

(Testimony of C. L. Breger.)

A. None that have ever been reported by competent authorities. [735]

Q. Do you know of any?

A. I know of none, and I would say there are none so far as anyone knows—so far as known.

Q. In geology? A. Yes.

Q. What definition do you give, Mr. Breger, of mineralized or mineral-bearing rock?

A. Mineralized or mineral-bearing rock is rock in which mineralization has taken place.

Q. Explain in what manner mineralization takes place to constitute the mineralized rock.

A. To constitute the mineralized rock it is necessary to have the rock in place originally, before mineralization takes place. That is necessary to begin with. Thereupon mineralization of the rock may take place by various methods, chief among which are the following: Fissure veins, or vein deposits of a general type of fissure veins, which mineralizations take place in crevices, fissures, or other cavities in such rock, by injection from without of valuable or other materials, usually carried in aqueous solution into such fissures, crevices or cavities. There are also replacement mineralizations, wherein the mineral-bearing solutions, or other mineral carriers, are deposited between the grains of rock in place, and such deposits are usually associated with the replacement of the constituent grains of the rock, to a greater or less extent, by the valuable minerals or mineral-bearing deposits in question. Such deposits are known as replacement deposits, as distinct from

(Testimony of C. L. Breger.)

fissure-vein deposits. There is a third class of deposits, [736] which hardly enters into the present discussion, and is known as magmatic segregations. Such deposits are confined entirely to granites and gneisses and original archaen or primitive rocks which have been molten and mineral depositions separated out to a more or less economical extent from such molten magma.

Q. Is this calcium phosphate a mineral-bearing or mineralized rock? A. Decidedly, no.

Q. Now, in mineralized rock, or mineral-bearing rock, what is the distinction which exists between such rock and this calcium phosphate?

A. In mineralized or mineral-bearing rock, the distinction, perhaps the principal distinction, as I have indicated, is, that to have mineralized rock, the country rock must be in existence—must have been in existence as such prior to the mineralization, and the mineralized or valuable mineral deposits must have been thereafter brought into their present position, and from without the limits of their present occurrence. Those are perhaps the principal distinctions. The phosphate rock was an original sedimentary deposit; it was deposited along with the other strata, below it and above it, to the extent of all the present valuable mineral deposits it bears, and there has been no mineralization or deposition of valuable mineral deposits therein after these rocks have become rock in place.

Q. The mineralized rock that you have described as being fissures, and as appearing by means of re-

(Testimony of C. L. Breger.)

placements, or replacement deposits, are they what you term a vein—veins?

A. Usually; except, perhaps, in the case of petroleum.

Q. What do you call a placer, Mr. Breger? [737]

A. A placer is a valuable deposit of natural mineral or rock, or mineral—or rock-bearing deposits, congregated or aggregated on the surface of the ground, or in bodies of water resting upon the surface of the ground; to which may perhaps be added such deposits congregated or aggregated within loose soil gravel or other detritus resting on the ground.

Q. As a result of your examination of the properties in dispute, these various claims, placer and lode, as well as your examination of and experience with phosphate rock in the western field, and as a result of your experience and training as a geologist, I ask you whether this phosphate rock is a vein or lode of valuable deposits?

A. It is not a vein or lode of valuable deposits.

Q. Well, is it a vein or lode of quartz or other rock in place?

A. It is not a vein of quartz, or of other rock in place.

Q. Is it a vein or lode at all?

A. It is not a vein or lode at all.

Q. Is this phosphate rock or calcium phosphate, rock in place?

A. Yes, as much so and to the same extent as the other beds of limestone, shale and sandstone, constituting the rest of the mountains.



(Testimony of C. L. Breger.)

Q. And does this phosphate rock bear any valuable mineral or ore for which the phosphate is mined?

A. No; it is itself the substance which is—it is itself the mineral or mineral deposit which is in demand.

Q. Similar to what other deposits? [738]

A. In much the same way as, particularly coal, and caolin, and gypsum, salt, limestone, sand, and numerous deposits of a similar nature, which are extracted for the deposits themselves rather than for any valuable materials or substances which can be extracted therefrom.

Q. Mr. Breger, have you ever had any experience in the practical operation of mines?

A. Not to any great extent. I am not a miner; I am a geologist.

Q. You don't represent yourself as a mining man?

A. Not at all.

Q. Simply as a geologist?

A. A geologist, and particularly a stratigrapher.

Q. You have never done any prospecting for valuable minerals?

A. Never, although in geologic work I have come across such deposits.

Cross-examination.

(By Judge DEY.)

Q. What is your age? A. 26.

Q. Are you a professor? A. No, sir.

Q. Are you a miner? A. I am not.

Q. You never followed that business?

(Testimony of C. L. Breger.)

A. I never practiced it. [739]

Q. Or a mining engineer?

A. Not that I have a degree of mining engineer.

Q. Have you any practical experience as a mining engineer?

A. So far as it includes the study of mineral deposits.

Q. Practical, I say.

A. Practical? No, sir; excepting in so far as such studies are practical—studies pursued by other mining engineers.

Q. You are an editor and geologist, then?

A. An associate editor of an important mining journal.

Q. And a geologist? A. And a geologist.

Q. How long have you been a geologist?

A. As a professional geologist, my experiences began with 1903; but I have studied geology before.

Q. Then when you were nineteen years old you became a geologist? A. Yes, sir.

Q. A professional geologist?

A. Yes, sir, and published a report for the Indiana Geological Survey.

Q. That entitled you to become a professional geologist, did it? A. Yes, sir.

Q. What report did you refer to?

A. A report on the stratigraphy and fossils of the Niagara bed of Northern Indiana, published by the Indiana Geological Survey early in 1904, with E. M. Kimball.

Q. Are you Mr. Carpel Leventhal Breger?

(Testimony of C. L. Breger.)

A. Yes, sir. [740]

Q. And at what age did you enter with the Geological Survey Department? A. At Washington?

Q. I don't care.

A. I was employed in connection with the work being undertaken by the Geological Survey at the age of nineteen.

Q. Prior to that time you had finished your education?

A. I should have said at the age of eighteen—

Q. Eighteen? A. —No, sir.

Q. Up to that time had you been to school?

A. Yes, sir.

Q. What school? A. The Cornell University.

Q. Graduated? A. Yes, sir.

Q. At eighteen?

A. No, sir; I graduated from Cornell University thereafter.

Q. Oh. I said up to that time had you graduated at Cornell?

A. I didn't understand the question in that way.

Q. Well, just answer the question.

A. At that time I had not.

Q. What year did you graduate?

A. I graduated in February, 1906.

Q. In 1906? A. Yes, sir.

Q. As what? [741]

A. As Bachelor of Arts, taking a course in science which would have entitled me to a degree of Bachelor of Science had that degree been maintained. It had been abolished a few years previous to my en-

(Testimony of C. L. Breger.)

tering the University.

Q. Seven years, however, before your graduation you became in your opinion a professional geologist?

A. Did you say "seven" or "several"?

Q. "Seven"? A. "Seven"?

Q. Yes. A. No, sir.

Q. 19 from 26—

A. I became a professional geologist in 1903, but I graduated in 1906.

Q. That is three years? A. Three years.

Q. Have you ever lived in the west?

A. Not except in connection with my field work.

Q. Which covered how many seasons?

A. 1910 and 1911—or, 1909 and 1910, and a few days in 1911.

Q. 1909 was the first year? A. Yes, sir.

Q. Who was with you in the west during 1909?

A. H. S. Gale, R. W. Richards, William Waggonman, comprised the official party, along with a cook and teamster, and a visit of a month with Dr. Girty.

Q. How many months was this party in the Rocky Mountains? [742] A. June, July,—

Q. How many, I say? A. I will have to count—

Q. I didn't ask what they were, but how many?

A. Five months.

Q. Five months? A. Yes, sir.

Q. And who was in charge of the party?

A. H. S. Gale was then Administrator in charge of the party.

Q. During that year of 1909 you investigated the question of saline lands? A. For a few days.

(Testimony of C. L. Breger.)

Q. For a few days? A. Yes, sir.

Q. Covering what country?

A. The region about Crow Creek, and the Idaho-Wyoming border in the vicinity of Star Valley.

Q. Now, "a few days"—what do you mean by that? A. It may have been a week or ten days.

Q. Did you prepare a report? A. Yes, sir.

Q. Found at pages 555 to 569 of Bulletin 430?

A. I don't remember.

Q. Well, see if that is right. (Exhibiting said Bulletin to the witness, who examined the same.)

A. Yes, pages 555 to 569, inclusive, Bulletin 430.

Q. Entitled: "The Salt Resources of the Idaho-Wyoming Border, with Notes on Geology"? [743]

A. I guess that's the title, as near as I can remember it.

Q. That you were able to do within a week or ten days' investigation? A. Yes, sir.

Q. Did Mr. Gale or Mr. Richards, to whom you referred, make a report? A. On the phosphates?

Q. On the work that summer? A. Yes, sir.

Q. On what deposits?

A. On the deposits embracing those in Georgetown Canyon.

Q. Well, of what class of deposits?

A. The phosphate deposits.

Q. You didn't participate in that?

A. Yes, sir, I did.

Q. You did?

A. Although my name doesn't appear among the authors.



(Testimony of C. L. Breger.)

Q. But you really wrote it, did you?

A. I didn't write it, no, sir. I participated in the drawing up of a report, and in writing it in part.

Q. You participated, in other words, in the preparation? A. Yes, sir.

Q. Have you a copy of that?

A. Have I the report?

Q. Have you that report? What is the number of it? Oh, I have it here.

A. I think it is part of Bulletin 430, isn't it?

Q. I hand you 430H, and ask you if that is the official Government report? [744]

(Exhibiting said Bulletin to the witness, who examined the same.)

A. Yes, sir.

Q. You assisted in collecting the data that came in this report? A. Yes, sir, most of it.

Q. Handing you this Bulletin 430H, and calling your attention to the bottom of page 42, and the first table on page 43; that is part of the report, is it not? A. That is part of the report, yes, sir.

Q. Made up from the investigations and examinations, etc., in the year 1909? A. Yes, sir.

Q. That summer? A. Yes, sir.

Q. And that refers to the beds of phosphate at Hot Springs, Idaho? A. Yes, sir.

Q. This same country? A. Yes, sir.

Q. That these are found in? A. Yes, sir.

Judge DEY.—I offer in evidence the portion commencing with the words, "the following is a complete section, together with the analytical tests made of the

beds exposed underground in the cross-cut adjoining the entry tunnels. It was made at the time of the examination of this property, September, 1909." From that on down, as follows: [745]

## PHOSPHATE DEPOSITS IN IDAHO, WYOMING AND UTAH.

### Section of Phosphate and Associated Beds at Hot Springs, Idaho.

Field No. of Speci- men.		$P_2O_5$ .	Equiva- lent to $Ca_3(PO_4)_2$ .	Thick- ness.	
		Per cent.	Per cent.	Ft.	In.
	Limestone, compact, hard....	....	....	10+	
141-A	Shale, brown, earthy, calcareous.....	9.0	19.7	1	6
141-B	Shale, earthy, massive,.....	2.0	4.4	2	8
141-C	Phosphate, oolitic, massive, dark gray.....	32.8	71.8	2	2
	Limestone, massive stratum...	....	....	2	2
111-D	Phosphate, medium to coarsely oolitic, dark gray.....	32.3	70.7		11
141-E	Shale, brownish, earthy, calcareous.....	3.5	7.7	1	
141-F	Phosphate, medium grained, oolitic, dark gray,.....	36.3	79.5	1	3
141-G	Phosphate: In.				
	(a) Shale, calcareous,....5				
	(b) Phosphate, oolitic, brownish.. .... 4	27.5	60.2	1	10
	(c) Shale, brownish, phosphatic.. .... 2				
	(d) Shale, brownish, phosphatic .....				11
141-H	Phosphate, medium to coarse grained, oolitic (main entry tunnel).....	29.1	63.7	5	10
141-I	Phosphate, medium to coarse grained, including pebbly texture,.....	28.0	61.3	1	5
141-K	Shale, phosphatic, dark brown, earthy,.....	24.3	53.2	11	
	Limestone.....	....	....	1	
141-L	Shale, phosphate, dark brown, earthy,.....	12.9	28.3+	10	6
	Shale, phosphate, dark brown, earthy.....	....	....	4	11
[746]					
141-M	Shale, phosphatic, somewhat oolitic.....	20.3	44.5	1	8
141-N	Shale, phosphatic, dark brown, earthy.....	5.2	11.4	4	6
				64	4

(Testimony of C. L. Breger.)

Judge DEY.—I call your attention to page 47, in reference to Raymond Canyon, in the Sublette Range.

Q. That is also part of that investigation and report that you participated in?

A. Yes, sir, with this qualification: that I did not personally collect those samples or make those detailed sections specifically described in these extracts.

Q. It was done in the regular Government—in the regular course of service?

A. Oh, yes—by the party.

Q. By the party, and you didn't do all of it?

A. Oh, no.

Q. That I understand.

A. In fact, that particular work, I didn't do any of that.

Q. That is at the place where these Wyoming claims in controversy are?

A. This place here? (Indicating in said book.)

Q. Yes—the same deposit, anyway?

A. It is a continuation of the same deposit.

Q. A continuation of the same deposit?

A. Yes, sir.

Q. As a matter of fact, is it not from the very property involved in these actions— [747]

A. I will have to look at that.

Q. —that are in Wyoming?

(Submitting said extract from said pamphlet or bulletin to the witness, who examined it.)

A. No, sir, I think these are not the property in dispute.

(Testimony of C. L. Breger.)

Q. Well, let's get the exhibits. Calling your attention to exhibits "A" and "B," can you locate the place shown in that part of the book?

A. Yes. The portion described here is mentioned as being in Raymond Canyon, and Raymond Canyon is a couple of hundred yards at least south of a little gulch which extends along the south edge of the Raymond placer mining claim.

Q. It mentions the tunnel, does it not, in Raymond Canyon?

A. Such tunnels exist, I believe, on the south side of the Raymond Canyon, which is without the limits of the Raymond placer claim and the Japan.

Q. And doesn't extend under them?

A. Not that I am aware of. In fact, these tunnels from which the samples were collected, as near as I can remember, were on the south side of Raymond Canyon.

Q. In a southerly direction? A. I believe so.

Q. Are you sure about that?

A. I don't remember offhand now.

Q. Well, it would be the same, anyway?

A. A continuation of the same deposit, yes.

Judge DEY.—We now read in evidence the following from said bulletin:

“Raymond Canyon cuts the Sublette Range in a [748] steep, narrow, and rocky gorge traverse to the trend of the range and to the major axes of folding in the strata. The phosphate beds are exposed by prospecting in the NW.  $\frac{1}{4}$  NE.  $\frac{1}{4}$ , sec. 6, T. 26 N., R. 119 W., by entry tun-

(Testimony of C. L. Breger.)

nels through the slide rock on the south side of the canyon. The cherty limestone forms a most prominent exposure in the canyon, standing nearly vertical like a massive rock wall about 80 feet thick, through which the creek passes in a gap hardly wider than the creek channel and the wagon road. The phosphate bed exposed in the principal prospects occurs high in the shaly division of the Park City formation, being relatively much nearer the cherty ledge than is the principal bed of the Montpelier section.

“The following section was measured and samples were collected at the Raymond Canyon prospects:

“Partial Section of Phosphatic Beds in Raymond Canyon, Wyoming.

Field No. of Speci- men.		$P_2O_5$	Equiva- lent to $Ca_3(PO_4)_2$	Thick- ness.	
		Per cent.	Per cent.	Ft.	In.
42-A	Shale, grayish brown.....	8.9	19.5	4	5
	Limestone.....	....	....	6	
42-B	Phosphate, massive, compact, black, oolitic .....	32.0	70.1	3	1
42-C	Limestone, dark, fine grained..	9.3	20.4	5	
				18	6

[749]

Q. Referring to this table, it says: “The following section was measured and samples were collected at the Raymond Canyon prospects:” Does that refresh your recollection?

A. Why, not so far as I can understand that—I didn’t write this particular paragraph. This would mean prospects in Raymond Canyon.



(Testimony of C. L. Breger.)

Q. Well, that is all called Raymond Canyon—that vicinity—isn't it?

A. Why, no, sir, there is a Coal Canyon and Francis Canyon.

Q. Well, I say, that immediate vicinity of Raymond Canyon? A. Not that I know of.

Q. I hand you this same bulletin. Calling your attention particularly to the last paragraph on page 10 and the table at the top of page 11; that was the result of the examination made by the party just referred to? A. No, sir.

Q. Eh? A. No, sir.

Q. The analyses were made by the Government at Washington?

A. Yes, sir, but not by any member of the party. The other analyses of the party were made in the field by Mr. Waggaman.

Q. But the material for the analyses was collected by the party? A. Yes, sir.

Q. And taken to Washington?

A. Yes, sir, and analyzed in the laboratory at Washington.

Q. And analyzed in the laboratories at Washington? A. Yes, sir. [750]

Q. By Mr. Steiger?

A. Yes, sir, who was a chemist of the Geological Survey, at Washington.

Q. Within this table is comprehended the Preuss Range—the deposits found in the Preuss Range—eight miles east of Georgetown, Idaho?

A. Yes, sir, it is in Georgetown Canyon.

(Testimony of C. L. Breger.)

Q. The same range of mountains?

A. The same range, yes.

Judge DEY.—We now read in evidence the following from said bulletin:

“The following more complete analyses of phosphate rock from these fields were made by George Steiger in the laboratory of the United States Geological Survey: [751]

Analyses of Phosphate Rock from Wyoming, Utah and Idaho.

	1.	2.	3.	4.
Insoluble.....	10.00	1.82	9.40	2.62
SiO <sub>2</sub> .....	None.	.30	Not det.	.46
Al <sub>2</sub> O <sub>3</sub> .....	.89	.50	.90	.97
Fe <sub>2</sub> O <sub>3</sub> .....	.73	.26	.33	.40
MgO.....	.28	.22	.26	.35
CaO.....	45.34	50.97	46.80	48.91
Na <sub>2</sub> O.....	1.10	2.00	2.08	.97
K <sub>2</sub> O.....	.48	.47	.58	.34
H <sub>2</sub> O.....	1.04	.48	.61	1.02
H <sub>2</sub> O+.....	1.14	.57	.75	1.34
TiO <sub>2</sub> .....	None	None	None	None
CO <sub>2</sub> .....	6.00	1.72	2.14	2.42
P <sub>2</sub> O <sub>5</sub> .....	27.32	36.35	32.05	33.61
SO <sub>3</sub> .....	1.59	2.98	2.34	2.16
F.....	.60	.40	.66	.40
Cl.....	Trace.	Trace.	Trace.	Trace.
Organic matter.....	Not det.	Not det.	Not det.	Not det.
	96.51	99.04	98.90	95.97

1. Main phosphate bed, 2½ miles east of Cokeville, Wyo.
2. Dunnellon claim, Crawford Mountains, Utah.
3. Elsinore claim, Tunnel Hollow, between Morgan and Devil's Slide, Utah.
4. Preuss Range, 8 miles east of Georgetown, Idaho.

[752]

Q. I call your attention to page 7 of this report and bulletin of the Government, and under the head-

(Testimony of C. L. Breger.)

ing "Source of Phosphoric Acid," it is stated: "An entirely satisfactory explanation has not yet been given of the source or manner of accumulation of the phosphoric acid," is it not?

A. Yes, it is so stated there. I would lay emphasis on that, if I may, that at the time—

Q. Well, never mind. Your counsel will ask you if there is anything to emphasize—after a while. I next call your attention to the following, found on page 22 of this report, where it is said: "The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales. They consist of very dense, compact, fine grained limestone, having a foetid odor when struck with a hammer, but showing a low percentage of phosphoric acid wherever tested, as all the dense, fine-grained limestones tested we found to run very low in phosphoric acid, tests of these rocks were abandoned in the latter part of the season's work." That is the fact, as the examination of your party up there showed that summer?

A. No, sir.

Q. Eh? A. No, sir.

Q. Is it not?

A. Except "The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales" should be modified to mean the phosphatic beds [753] and all the phosphatic shales other than the principal

(Testimony of C. L. Breger.)

phosphate beds.

Q. Why didn't you modify it when you went over this report?

A. I didn't write that; and besides, that is a very minor and technical point, that there were so many divergent—

Q. You assisted, you stated, in the preparation of the work, and in the preparation of this report?

A. Yes, sir.

Q. And now you want to qualify it?

A. I have no responsibility for that report myself. My name does not appear in the authors.

Q. Did you suggest it being changed at the time?

A. No, sir; the point didn't occur to me at the time.

Q. Oh. When did it occur to you?

A. It has since occurred to me.

Q. Who brought it to your attention?

A. Nobody that I know of, except that I don't remember in my experience the year before (1909 or 1910) having seen any phosphate nodules in the main bed.

Q. Did you talk it over with Mr. Weeks?

A. No, sir.

Q. Not a word?

A. Not a word with Mr. Weeks.

Q. Who with? A. Nobody that I know of.

Q. Nobody that you know of? A. No, sir.

Q. When did it occur to you, recently? [754]

A. When did it occur to me?

Q. Yes—recently.

A. I don't know that I can point out any moment

(Testimony of C. L. Breger.)

that it occurred to me.

Q. Since you came here to Pocatello?

A. No, sir.

Q. While you were in Chicago?

A. Well, I don't know that; it may have been in Washington or on the train to Chicago; or it might have been in the fall of 1909 or 1910.

Q. Oh—I thought you said recently.

A. Well, that is, after the close of the field season, yes, in 1909; or it may have occurred to me then to mark the wording there, to make that statement true, in that limestone nodules are found in the phosphate beds and phosphate shales.

Q. You have gone over this report, recently, have you?     A. Over the whole report?

Q. Yes.

A. Oh, I have glanced at the parts you have shown me, and I have rambled through parts of it.

Q. Is there any other part of it, after your examination of the report, that you want to change?

A. Not without reading and studying the whole report.

Q. That you think of now?

A. Excepting the point you just mentioned now, as to an entirely satisfactory explanation having yet been brought out. Of course, there was inserted the words, "entirely satisfactory"; and besides, that was written in 1909.

Q. That is, the work was done in 1909— [755]

A. And the report was written—

Q. —less than two years ago?



(Testimony of C. L. Breger.)

A. I think it was entirely completed over two years ago.

Q. Before the first of July?

A. Yes, sir; it was completed before the field season—completed, I should think, along about in April—I think in April or March, it was practically completed in March, and some illustrations I think completed in April.

Q. Did you examine the field in the winter, after the snow—

A. No; the report was written up in the fall and winter, in Washington.

Q. Well, that would be the winter following the summer of your examination?

A. Oh—pardon me.

Q. In 1909?

A. Oh, yes, in 1910—pardon me; I was thinking that was 1909.

Q. So this report was prepared a little over a year ago?

A. A little over a year ago. I was thinking of 1909 all the time.

Q. Now, during that year it has become more certain to you, has it?

A. The phosphates have been more extensively studied by the Geological Survey and others.

Q. And consequently, it is a very deep study, is it not?

A. Well, that would depend on what you mean by “very deep.”

Q. Well, I mean a complicated study? [756]

(Testimony of C. L. Breger.)

A. Well, to the layman as much so as any technical work in any profession would appear.

Q. Exactly—to anybody, perhaps, except the young graduate?

A. Oh, no, not at all, no, sir—to a prospector, or a miner, or a geologist, whether he was young or otherwise.

Q. On page 33 I find this:

“Enrichment may have been due in part to a secondary replacement of lime by phosphoric acid; but in most weathered exposures it seems to be largely the result of leaching of the more readily soluble lime, the proportion of the residual phosphates being thereby increased.”

That is correct, is it?

A. I wouldn't say that.

Q. As I have read it?

A. I would like to read it and see what it refers to.

Q. You certainly can.

(The witness read the same.)

A. This “enrichment” refers to a preceding sentence, in which it says that the exposures from which these samples were taken were near the surface of the ground, the strata standing in nearly a vertical position, and all were more or less weathered and of earthy composition, a factor which is generally understood to enrich the phosphatic content.

(Testimony of C. L. Breger.)

Q. On page 54 I find the following in this report:

“In a hasty review of the area southwest of Cokeville, a piece of rock picked up at the monument of [757] the quarter section corner on the west side of Section 36, T. 24 N., R. 120 W., Wyoming, was found on test to be rock phosphate, equivalent to about 70% bone phosphate grade. This rock was collected with a number of other specimens from oolitic limestone of the Twin Creek formation, such as is observed in many places throughout the Idaho, Wyoming and Utah field. Most of the dark bluish oolitic limestone specimens, many of which represented rock in place, proved to contain but a negligible trace of phosphoric acid. This specimen of commercial phosphate was derived from float, and being of angular form had probably not been transported far. This phosphate, which resembles the oolitic jurassic beds found in natural outcrop nearby, is thought to have been derived from this portion of the formation. No outcrop of the older or carboniferous phosphates are now known nearer than those of the Cokeville mines, a distance of more than six miles.”

A. Would you mind including the next sentence?

Q. Not at all. You may read the next sentence.

A. “The Twin Creek phosphate beds had not, however, been found in place.” I would qualify that. In the season of 1910, in Hoback Canyon, which is about 85 miles east of north of Cokeville, I collected from apparently this same oolitic horizon

(Testimony of C. L. Breger.)

in the Twin Creek, samples which were sent to Washington, and word was sent back that they contained 60% phosphate.

Q. Well, wait a minute. Was the word sent back by letter? [758] A. By telegram.

Q. By telegram? A. Yes, sir.

Q. Have you the telegram?

A. I have not. That is not my property, of course. Well, I want to continue that.

Q. Well, I want the best evidence.

A. Well, that may be brought up in what I am about to say. On returning to Washington, and comparing the laboratory numbers of the specimens submitted and the laboratory records of the phosphate contained in these samples, I found that the record showed only a trace of phosphoric acid, in the chemical analyses of those samples. So that the entire matter of "jurassic" possibly was wholly in the air.

Q. Like a great many other things connected with the matter? A. Not a great many.

Q. Quite a good many?

A. Well, I should prefer to have those pointed out to me before I commit myself.

Q. On page 63 I find the following:

"The most massive or less shaly material and that most coarsely oolitic is considered the best ore. The rock of the workable bed is dark gray when freshly taken out, drying to a light gray in the air. It is of fine to medium and in part coarsely oolitic texture, and shows both massive

(Testimony of C. L. Breger.)

and shaly structures.”

A. May I refer back to what that refers to?

[759]

Q. Sure.

A. Yes. This word “ore” here is used in a general and very loose sense, and not at all in a technical sense; besides which, I remember that this statement was given to us by some of the men on the ground. The fact that the miners consider the shaly material, or the most coarsely oolitic, the best ore, is not determined primarily by the geologists, but they took the word of the men there, and there was nothing to contradict that. The word “ore,” as a matter of fact, is used very loosely there.

Q. In other words, from the scientific or geological use of the word, you would not use it here?

A. Oh, most emphatically no.

Q. But from the ordinary miner’s standpoint they used it—

A. No, sir.

Q. —and consequently you used it in this report? Is that it?

A. No, sir, not from the ordinary miner’s standpoint.

Q. Oh—what kind of a miner?

A. Those particular men at the mines in the Crawford Mountains, who, you understand, were farmers from the Woodruff Valley.

Q. They were mining?

A. That didn’t make them miners.

Q. Did it make them farmers?

A. They had been farmers.



(Testimony of C. L. Breger.)

Q. How do you know?

A. I understand that. In fact, I don't know.

Q. Oh, you understand it?

A. Yes; that is what I have been given to understand by [760] Gale and Richards. I didn't examine those mines in detail myself.

Q. Well, when you come west and see so many miners, you size them up as farmers; is that right?

A. Why, not at all.

Q. That was your first trip west?

A. Why, that was, yes.

Q. Did Mr. Taylor, of the San Francisco Chemical Company, furnish any of the data for this report of that season?

A. Not that I know of, except that he furnished us with mine maps and every facility to investigate the deposits about Montpelier; but he had no part in writing the report; but there was a report submitted to him.

Q. But for information that is contained in the report?

A. Well, I don't know, without reading, whether he did furnish any information that was embodied bodily in that report.

Q. Well, you know, do you not, that he called it "ore"? A. I don't know that.

Q. You never heard him call it anything?

A. I never heard him call it what?

Q. Anything?

A. I have heard him call it phosphate rock.

Q. At that time?

(Testimony of C. L. Breger.)

A. When are you referring to?

Q. At the time this examination on which this report was based was made? A. Oh, yes.

Q. Did anyone else connected with the San Francisco Chemical Company furnish any information to the party, to enable the [761] preparation of this report or bulletin?

A. As near as I can remember I should say no, except in so far as the employees of the company assisted us in examining the property and offered us every facility to examine those properties.

Q. These farmers?

A. I think Mr. Groo was about the only man who was connected with showing us about the property, and showing us the workings, and he was a miner.

Q. Among other considerations entering into this report I find the following on page 77, under the heading of "Availability of Low Grade Phosphates," from which I read you:

"In the tonnage summaries of the several districts a number of references have been made to the feasibility of future use of the low-grade phosphate-bearing rocks, and a statement in review of the entire field may serve to emphasize the importance of this phase of the subject. Throughout the areas covered by the present tonnage estimates of high-grade rock the phosphatic portion of the Park City formation contains in addition at least 40% of phosphatic shales, averaging perhaps 18% of P<sub>2</sub>O<sub>5</sub>, equivalent to about 40% of Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>. Or, in round numbers, to

(Testimony of C. L. Breger.)

a billion tons of low-grade rock."

A. Yes—of low-grade rock.

Q. Is there any explanation you desire to make, or does that sufficiently speak for itself?

A. I think that is correct. Mr. Gale wrote that report; [762] but the entire matter of the feasibility of using low-grade raw phosphate was suggested by myself, and Mr. Gale and I discussed that problem, and Mr Gale wrote the report.

A. The use referred to there is as crushed raw rock, untreated, such as what is known as the Liege phosphate, in Belgium and France, which will average between perhaps 30 and 40% tricalcic phosphate; and the low-grade phosphate rock of Central Russia, of about the same composition.

Q. Well, did you write that portion that I read?

A. I did not write those words, no, sir.

Q. I understand Mr. Gale wrote that?

A. Mr. Gale wrote that; but Mr. Gale and I discussed that, and I suggested the feasibility of the use of the low-grade raw rock.

Q. You suggested that? A. Yes, sir.

Q. In other words, bringing in all as a body to commercial value? A. Yes, sir, as raw manure.

Judge DEY.—I move to strike out "as of raw manure," as voluntary, and not called for.

Q. Will you please step up here to Defendant's Exhibit 2. Referring to the black line, I understood you to say on direct examination that you checked it up on the ground?

A. In the important and essential points.

(Testimony of C. L. Breger.)

Q. Did you not say "in the important and crucial" points?

A. Not that I remember of—possibly I did.

Q. Possibly you did?

A. But that would show. [763]

Q. Now, where are the crucial points?

A. I saw the discovery stake on the Maury lode, and the stakes 6 and 9, 25 feet distant from the center of that vein.

Q. Now, wait a minute. The Maury lode is not involved in this action in any way whatsoever; consequently you may limit yourself to the crucial points upon the ground involved in this action.

A. By that I understand the Wizard placer, and the Hickman lode,—

Q. You may take the lode claims.

Judge DEY.—Is the Hickman in, Mr. Budge?

Mr. BUDGE.—Yes.

Judge DEY.—All but the Maury—

Mr. JACK.—All but the Maury and Tennessee.

Judge DEY.—All but the Maury and Tennessee. Yes; the Maury and Tennessee are not in.

A. At the corner 5 of the Hickman lode, the southeast corner of the lode, the phosphate emerges from the overlying strata, as does the limestone band overlying the alleged vein above; and southeast of 5, and without the limits of the Hickman lode, and extends without the limits of the Hickman lode, and above the limits of the Hickman lode, for about 100 feet, and then dips down into the Hickman lode; so that for that distance of 100 feet the outcrop, so to say,

(Testimony of C. L. Breger.)

of the supposed phosphate vein is above and outside of the Hickman lode. Also, in the southwest extension of the Hickman lode I examined the corners marked on Defendant's Exhibit 2 as 10, 6 and 8, and found within this extent that this portion of the Hickman lode was not on [764] phosphate at all, but was in the underlying limestone. Then—

Q. Wait a minute. Before you leave that place, the condition, as explained and as shown by this exhibit, wherein is the important and crucial points, is what I don't understand.

A. In that the important point was to demonstrate whether the outcrop occurred within or without the lode at certain points.

Q. That is all there was of it?

A. Oh, no, sir; and to demonstrate that by the corners on the ground. That is to say, we determined, for instance, in the Arkansas lode, that within this area the lode was within the alleged vein, or within the lode; whether it was five feet below I considered immaterial.

Q. Now let us just get to the point.

A. I want to understand the point; probably I don't.

Q. Now, the point is to explain or to show whether it was within or without, on the outcrop, the exterior boundaries of the lode claim?

A. And placer, and to verify the correctness of the delineation of the line of emergence of the alleged vein.

Q. At this place shown on this photograph of Ex-



(Testimony of C. L. Breger.)

hibit 4 the exposure of the bed of phosphate is truncated? A. Yes.

Q. Eh? A. Yes—by erosion.

Q. Truncated by erosion? A. Yes, sir.

Q. Did you select that place for taking the photo?

[765]

A. I didn't take that photo.

Q. I didn't ask you that; I asked you if you selected that place? A. For taking the photo?

Q. Yes.

A. No, sir; I had nothing to do with that photo.

Q. It stands out there truncated, just like in the Charles Dickens mine in Idaho,—a lead-silver?

A. I have never examined that mine?

Q. Oh, you haven't? A. No.

Q. And I was going to ask you how they mined at the Charles Dickens, where it is truncated?

A. I am not acquainted with that mine, either by examination or investigation.

Q. Now, you said at near the close of your direct examination that you didn't know anything about the different ways of mining.

A. I didn't say that; I said I wasn't a miner. I didn't say I didn't know anything about the different ways of mining.

Q. Oh, I see. You understand mining by the sluicing system, do you?

A. I have a faint idea of it, as practiced in Arizona.

Q. Just a faint idea? A. Yes.

Q. Do you have an understanding of the operation

(Testimony of C. L. Breger.)

of mining by the caving system?

A. Of the caving system? [766]

Q. Yes.

A. Do you mean by "caving system" what is known as—

Q. I mean, sir, in the ordinary mining parlance. I use the words "caving system" in the ordinary mining parlance, not in a geological sense.

A. The caving system, as I understand it, is where a deposit is mined out and no timbers are allowed to stand, and the deposit allowed to take care of itself; that is, the roofs and floors are allowed to take care of themselves.

Q. Where have you seen the caving system of mining?

A. I don't know that I have ever seen it anywhere.

Q. What do you know about the Stulling system of mining? A. The which?

Q. The Stulling system. A. I never heard of it.

Q. The square set system?

A. Well, that is simply a method of installing timbers in mines, without reference to the manner of mining itself,—

Q. It is what? A. —as I understand it.

Q. As you understand it? You don't know anything about it?

A. I am not a miner. I say, as I understand it.

Q. You understand more about quarrying?

A. A little more.

Q. Eh?

A. A little more, and that I have seen and exam-

(Testimony of C. L. Breger.)

ined more quarries than I have mines; but I am not a quarryman, either. [767]

Q. I will now take it over in Wyoming there, with a dip of  $85^{\circ}$ —

A. What part of Wyoming are you referring to now?

Q. These claims in question. A. Yes.

Q. That is the dip, isn't it—about  $85^{\circ}$ ?

A. Approximately.

Q. Approximately  $85^{\circ}$ ? What process of quarrying have you in mind? You have answered here that it is quarried.

A. In the Raymond Canyon itself the phosphate bed could be quarried to a very slight extent; but, of course, it would have to be mined there as a bed of coal is mined, standing on edge.

(At the request of Judge Dey the last question was repeated.)

Mr. BUDGE.—As I understand, the witness didn't say that this was quarried in Raymond Canyon. If he did, I haven't any recollection of it.

WITNESS.—I didn't say that.

Judge DEY.—Q. Take the Raymond Canyon, where the properties are which are involved in these Wyoming cases, where the dip is approximately  $85^{\circ}$ ; how would you mine that by the quarry system?

A. I would hire a miner to do that.

Q. In short, you know nothing about the practical operations of mining, do you?

A. I wouldn't say that—I wouldn't say that I know nothing about the practical operations. [768]

(Testimony of C. L. Breger.)

Q. Practically nothing? A. No, sir.

Q. You would say that you understood the system of mining? A. Not thoroughly.

Q. Blasting is required in this phosphate rock, isn't it, at depth? A. At depth?

Q. Yes.

A. Where the rock is sufficiently hard I suppose it would be.

Q. In other words, you suppose that wherever blasting is required, blasting is required?

A. Why, no.

Q. Eh?

A. No. The rock, as a matter of fact, could be very economically mined out with channeling machines, or mechanical cutters.

Q. With a channeling machine?

A. Yes, sir, without blasting.

Q. Are they in use in Idaho?

A. I believe they are, in coal mines in Idaho. In fact, I am certain they are in use in Montana. No, I don't know that they are in use in Idaho coal mines; but Idaho coal mines are not sufficiently developed. No, I would say they are not in use in Idaho; but they are in Montana.

Q. Passing from that subject now to this great extensive area you have referred to as being—under which, if I understood [769] you correctly, you say asphaltum beds exist; is that right?

A. Where is that?

Q. This great extensive area which you have described, under which you say it is all one layer of

(Testimony of C. L. Breger.)

asphalt—or, phosphate rock?

A. I didn't say that. I said the phosphate was originally deposited and has been in existence over the entire area within the limits described, and so far as its extension outside is concerned we don't know, but it probably does extend.

Q. When you say "has been" you don't refer to the present?

A. I do, in the same sense as I would refer to a coal bed over a similar area.

Q. Now, for illustration, I call your attention to the yellow exhibit, Defendant's Exhibit 1. Throughout the territory shown upon that exhibit the green colored is where the exposures of phosphate rock occur?

A. So far as I know. I didn't examine it.

Q. Well, that is about the way, throughout that country? A. Yes, sir.

Q. Do you mean to say that it is the same throughout a territory of several hundred miles square?

A. Throughout a territory of several hundred thousand miles square you find this same series of phosphatic shale, in precisely the same stratigraphic association, as you would find a series of coal-bearing shales, or coal-bearing measures, as they are known. Throughout this area you find at the base of the measures a workable, although not always the main phosphate [770] bed, and there are other beds higher up within the shale. These beds—

Q. What question have I asked was it that calls for this speech?



(Testimony of C. L. Breger.)

A. Will you read the question, please?

(The last question was repeated, as follows:)

“Q. Do you mean to say that it is the same throughout a territory of several hundred miles square?”

A. Do you want me to answer that now?

Q. No. Now, take the mines in limestone, at Park City— A. Did you mean—

Q. —Bingham, Mercur, or the Tintic districts, or Eureka, Utah, or Deep Creek, in Utah and Nevada, and over at Leadville in Colorado; you would make the same application there— A. No, sir.

Q. —that you do—let me talk a minute and I will give you a chance—that you do with the phosphate deposits, would you not?

A. I would not. In that—

Q. Hold on. That answers it. Isn't one just as reasonable as the other? A. Certainly not.

Q. Have you made a study especially to ascertain?

A. A study to ascertain?

Q. Yes.

A. I have studied enough to ascertain. [771]

Q. Have you made a special study—

A. A special study—

Q. —covering the questions suggested?

A. I have made a study—

Q. Just answer the question.

A. A special study?

Q. Yes.

A. For that particular purpose?

Q. He will read it—he will read the question.

(Testimony of C. L. Breger.)

A. No, I have not—as the question is put.

Q. You visited the ground involved in these actions quite recently?     A. Yes, sir.

Q. For what purpose?

A. For the purpose of verifying my recollections of it, having turned in my note-books to the Geological Survey, and not having any notes at hand; and for the purpose of qualifying myself so far as possible as to any details that I might be questioned upon, to answer them, by either one side or by the other.

Q. In respect to what, in particular?

A. As to the form and nature of the deposit.

Q. As to the form in which it was found?

A. As to the form in which it occurs and was—yes, as to the form in which it was found in this particular area.

Q. Referring now to the Wyoming properties or lode claims; you found that the dip was about 85—approximately 85°?

A. Approximately; but sometimes in one direction, and sometimes in the other. [772]

Q. But approximately 85°?     A. Yes, sir.

Q. What thickness did you find the series to be?

A. The phosphate series in Raymond Canyon and the vicinity, do you mean?

Q. The properties that you claim are in the Wyoming cases.

A. As near as I can remember, about 150 feet, I should say.

Q. How did you get that?

(Testimony of C. L. Breger.)

A. Because I made those measurements once, and those notes were turned into the survey—maybe 125 feet, maybe 165.

Q. You found it in place in the body of the mountain?

A. As much so as the other strata—no more and no less.

Q. Well, that is in place as much as anything could be in place, is it not? It is part of the mountain?

A. Well, it is rock in place as much so as the other strata, and neither more nor less.

Q. What do you understand by the words “rock in place”?

A. “Rock in place,” as I understand it, would be solid rock, or solid conglomerate, forming part of the country, and not a deposit resting on it.

Q. Now, I ask you whether this was not rock in place? A. Yes.

Q. As a geologist, let me ask you: Assuming that there was a fissure cutting the bed of this property at Montpelier, filled with the allotropic form of apatite; would you class it as a vein or lode?

A. Do you mean a vein or lode in the geologic sense; or [773] a vein or lode deposit, subject to a vein or lode location?

Judge DEY.—Read him the question. You pay attention to the question.

(The last question was repeated, as follows:)

“Q. As a geologist, let me ask you: Assuming that there was a fissure cutting the bed of this property at Montpelier, filled with the allotropic

(Testimony of C. L. Breger.)

form of apatite; would you class it as a vein or lode?"

A. Such a deposit would be a true fissure vein, and being a mineral it might be—there might be some justification for locating such a deposit as a lode or vein.

Judge DEY.—That's all.

Redirect Examination.

(By Mr. BUDGE.)

Q. Mr. Breger, you said in referring to this great area within which this deposit of phosphate rock was found, that it was some hundreds, or hundreds of thousands of miles square—something to that effect. You meant square miles?

A. Square miles, yes. And if I may, I might make another correction which I think I misstated yesterday.

Q. All right.

A. I think I mentioned the finding of phosphate in Horse Canyon, near Brent's ranch, ten miles north of Circle. I meant ten miles north of Dubois, Wyoming.

Q. You mean Dubois, Idaho? [774]

A. Wyoming.

Q. Wyoming?

A. Wyoming. I may have said Dubois, but I think I said Circle.

Q. In main phosphate beds you don't find phosphate nodules? A. Phosphate nodules?

Q. Yes.

A. Why, you find these phosphate oolites; you

(Testimony of C. L. Breger.)

don't find limestone nodules.

Q. You don't find limestone nodules?

A. You don't find limestone nodules, as far as I have examined it, in the Wind River Mountains and elsewhere.

Q. Now, in referring to this, counsel asked you if this was not a complicated subject. I will ask you whether in geology there is anything exactly similar to this deposit?

A. There is nothing exactly similar. The nearest similarity is with the black shale deposits, which occur in the Devonian black shale in Tennessee, and which extend into Northeast Georgia and Northwestern Alabama.

Q. Well, what common deposit is it that has the greatest similarity to this bed?

A. The hard rock of Florida. In being a rock in place?

Q. Yes; but I am asking about other deposits other than phosphate?

A. Oh, the nearest? Well, there are a lot of deposits which could be considered near, geologically, or in a mining sense, including particularly coal, gypsum, salt, sandstone, [775] ordinary limestones, which are indeed often quarried for furnishing fertilizers, especially chalky phosphatic limestones; and numerous other deposits.

Q. Are you acquainted with Dr. Girty?

A. Yes, sir.

Q. Dr. George H. Girty? A. Yes, sir.

Q. Have you seen a bulletin published by him,



(Testimony of C. L. Breger.)

known as Bulletin No. 436, entitled "The Fauna of the Phosphate Beds of the Park City Formation, in Idaho, Wyoming and Utah"? A. Yes, sir.

Q. Have you read that bulletin?

A. Why, I haven't read it through. I have seen it, and read parts of it.

Q. What is meant by the fauna?

A. The fauna is an aggregate of fossil animals, as distinguished from flora, which includes fossil—well, in this geologic case, fossil plants. But fauna in general is a series of living animal organisms.

Q. Are these shales and fossils shown clearly in this deposit of phosphate rock?

A. They are particularly conspicuous in some of the shale and limestone bands in the phosphate series; and I have myself found fossils in the main phosphate beds on the Waterloo claim, and in the area covered by the Obed lode, in Gertch Canyon.

Q. Are you acquainted with Eli Blackwelder?

A. Yes, sir.

Q. Who is Mr. Blackwelder?

A. Mr. Blackwelder is Professor of Geology in the University [776] of Wisconsin, and is employed also on the Geological Survey.

Q. And were you with him in your trip throughout this country? A. In 1910, yes, sir.

Q. In 1910?

A. He was the administrator at the head of the party, although we both consulted as to the work to be done.

Q. In the experience which you had in the field in

(Testimony of C. L. Breger.)

connection with the Geological Survey, and in the preparation of reports, was it the practice throughout the area visited by the members of the party to make inquiries of persons owning different properties, that the party desired to examine?

A. Yes; that was the usual practice with the Geological Survey in all its field parties. But the personal opinions of these parties were never allowed to influence the report made thereon.

Q. However, you made inquiries, did you, of mine managers and foremen and so on, in regard to these properties, and obtained what assistance they were able to give you, in expediting your examination of the properties? A. We did, in 1909.

Q. Well, was that the practice of the Survey while you were with it? A. Yes, sir.

Q. Was that the practice? A. Yes, sir.

Cross-examination.

(By Judge DEY.) [777]

Q. You have just said that the reports were not influenced by the mine owners, or those engaged in the mining. You mean, I take it, only so far as you are concerned?

A. So far as I am concerned, and so far as I am aware.

Q. And so far as you are aware? A. Yes, sir.

Q. You have no knowledge upon that subject as to Mr. Weeks, have you, who was on the stand here?

A. I have no knowledge directly.

Judge DEY.—That's all.

Mr. BUDGE.—You may explain, if you have any

(Testimony of C. L. Breger.)

further explanation.

A. Mr. Weeks was geologist on the survey, and like geologists who enter every mining camp, inquired of the mine managers, mine superintendents, or those in authority, for permission to examine the workings of the mine, without which examination the survey of the field would have been totally inadequate; and that is the usual custom everywhere. But so far as allowing the mine managers' statements or opinions to bias in any way at all improper, the report, why I know of no instance on the Geological Survey in which that has been the case.

Judge DEY.—Q. You would be surprised, then, if you were informed of an instance where a person, while in the service of the Government, was privately working in, or was working and advising private persons in respect to legal rights in the matter?

A. I would not.

Q. You would not? [778]

A. No, sir. I have heard—

Q. I see. It is frequently done? A. No, sir.

Q. Well, then, would you be surprised or not?

A. I know of one such case.

Q. You would not be surprised?

A. That is, I know of it by hearsay.

Q. Do you know of such a case by hearsay?

A. Yes, sir.

Q. Is it of common occurrence?

A. It has not occurred in the Geological Survey at all.

Q. Oh, it has not? A. No, sir.

(Testimony of C. L. Breger.)

Q. What department?

A. It was in the Land Office, I believe.

Q. In the Land Office, and you have heard of but one instance?

A. That is all I have heard of.

Q. Who was that?

A. I believe it was a Mr. Sterling, who was sent out to investigate, as near as I have been made to understand, as to the—

Q. I asked you who it was. I am not asking for hearsay from you, my dear sir. Who was it?

A. Will you repeat the question, please?

(Said question was repeated.)

“Q. Who was that?”

Judge DEY.—That is all the question.

A. Mr. Sterling, as I have been made to understand. [779]

Q. Mr. Sterling? A. Yes, sir.

Judge DEY.—That's all.

Mr. BUDGE.—Q. Just one more question, Mr. Breger: As a geologist, Mr. Breger, I will ask you whether or not this calcium phosphate is ore?

A. No, sir.

Q. And why not?

A. An ore must above all contain some economically valuable metal which can be extracted and usually is extracted therefrom. As a matter of fact, many deposits which do contain metals, and which metals are often extracted therefrom, are not considered ores, in the sense that calcium may be extracted and is extracted from limestone; but limestone or

(Testimony of C. L. Breger.)

chalk is not considered an ore on that account. Nor is phosphorus a metal.

Q. Well, the reason this is not ore is, as you say, because it does not contain a metal for which it is mined, for the purpose of extracting that metal?

A. Yes, sir; that is correct.

Mr. BUDGE.—Well, that is all.

Judge DEY.—Q. Is there from your standpoint some strict line of demarcation between metalliferous and nonmetallic ores?

A. Between metalliferous and nonmetallic ores?

Q. Yes.

A. Those are two entirely different classifications, in that—would be— [780]

Q. Well, if the question is not intelligible to you, I will reframe it. Read the question.

(Said question was repeated, as follows:)

“Q. Is there from your standpoint some strict line of demarcation between metalliferous and nonmetallic ores?”

A. Between metalliferous and nonmetallic ores?

Q. Yes—some strict line of demarcation—dividing line, in other words?

A. Yes, sir; between metalliferous and nonmetallic ores there is.

Q. Between the classification—

A. —of metalliferous and nonmetallic ores there is a distinct dividing line, and those ores which are—

Q. Of the classification?

A. —of metalliferous and nonmetallic ores?

Q. Yes.



(Testimony of C. L. Breger.)

A. I wish to emphasize the two words in this connection.

Q. I will not be technical at all, myself, you understand.

A. Well, you are speaking of a technical subject, so I cannot apply loose and general definitions on a technical subject very well.

Q. As the question was asked, it is not intelligible to you? Is that it?

A. It was intelligible to me, as asked.

Q. Is your answer yes or no, as to whether there is any line drawn separating the two classes?

A. Of metalliferous and nonmetallic ores? [781]

Q. Yes. A. I would say there is a distinct line.

Q. Or minerals?

A. The word "nonmetallic" there is very ambiguous, and as the question is put there I should say there is no distinct line.

Judge DEY.—That's all.

Mr. BUDGE.—Q. But in the technical sense give your explanation, Mr. Breger, as to the difference between metalliferous and nonmetalliferous ores.

A. That is a different question altogether. The difference between metalliferous and nonmetalliferous ores is a different question than one between metalliferous and nonmetallic ores; and answering this question directly I should say that a metalliferous ore is a mineral or rock product from which the common metals are extracted, and which is mined primarily for that purpose; and a nonmetalliferous ore includes all valuable minerals, or rocks, or minerals,

(Testimony of C. L. Breger.)

or rock bearing deposits which are not mined primarily for the extraction of a common metal.

Q. As the term is commonly understood in geology, are there ores which are not metalliferous? In other words, to constitute an ore, or a substance an ore, must it not contain metal?

A. It must certainly contain metal.

Q. And I will ask you whether it is not also necessary that in order for it to be an ore that it must be mined for the extraction of that metal?

A. Yes, sir. [782]

[Testimony of Fred. B. Weeks, for Defendant  
(Recalled—Further Cross-examination).]

FRED. B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination.

(By Judge DEY.)

Q. You are familiar with the classification of veins, are you not? A. I think so.

Q. And in general classification there are stratified veins or bed veins, are there not?

A. There are what is known as bedded veins.

Judge DEY.—Just read him the question, and see if we can get an answer.

(Said question was repeated, as follows:)

“Q. And in general classification there are stratified veins or bed veins, are there not?”

A. I don't know in general classification of stratified veins; I do know of bedded veins.

(Testimony of Fred B. Weeks.)

Q. Is the work entitled "Ore Deposits of the United States and Canada," by Kump (?), a work of established reputation and acknowledged authority, Mr. Weeks?     A. Yes, sir.

Q. I have the Third Edition. In the appendix, page 448, it says: "In the following pages the principal schemes of classification of ore deposits are graded according to certain relationships and similarities running through them," and under [783] the schedule of "Scheme involving the Classification of Ores," on page 452, I call your attention to the classification given by Lottner-Serlo, in which I find note "B. STRATA. BEDS. SEAMS." That is given there, is it not?     A. Yes, sir.

Q. On page 453, "J. D. Whitney, Metal Wealth of the United States, 1854," under subdivision 2, reading:

"STRATIFIED.

"A. Constituting the mass of a bed or stratified deposit.

"B. Disseminated through sedimentary beds.

"C. Originally deposited from aqueous solution."

On page 454, "J. S. Coobre (?), School of Mines, March, 1880, under subdivision 2:

"STRATIFIED.

"A. Forming entire strata.

"B. Disseminated through strata.

"C. Segregated from strata."

On the same page, "J. A. Phillips, Ore Deposits, 1884," under subdivision 2, entitled:

(Testimony of Fred B. Weeks.)

“STRATIFIED.

“A. Deposit constituting the bulk of metaliferous beds formed by precipitation from aqueous solution.

“B. Beds originally deposited from solution, but subsequently altered by metamorphism.

“C. Ore disseminated through sedimentary [784] beds in which they have been chemically deposited.”

Does it not thus appear that bed veins and stratified veins are referred to in the works of science?

A. They are referred to in this, classifications which were made thirty years ago.

Q. And extending back even further than thirty years ago? A. Much further.

Q. Going back to the time of the great old Roman, Agricola, do they not?

A. I understand so. I never read the works.

Q. In the 16th century? A. I think so.

Q. Does phosphorite occur in veins?

A. I think it does. I have never seen it personally, but I believe it does.

Q. It may occur in veins?

A. I think so. I believe so.

Q. And in pockets? A. I believe so.

Q. In veins with strike and dip?

A. Yes; I should expect them to have strike and dip.

Q. Is arsenic a metal? A. I think so.

Q. How long since it has been classed as a metal?

A. I couldn't say.

(Testimony of Fred B. Weeks.)

Q. It hasn't been?

A. I am not sure about that. I said I thought so. I am not sure about it. [785]

Q. Oh, you are not? A. No, sir.

Q. What is your opinion about it—about the proper classification?

A. I don't think it would be properly classified as a metal.

Q. Have you looked in the old and new encyclopaedias to determine as to the former and present classification of arsenic, in reference to it being metallic or nonmetallic? A. No, sir, I have not.

Q. How about antimony?

A. I think it would be classed the same.

Q. As a metal? A. Nonmetal.

Q. Taking your explanation of the deposit or deposits involved in these actions, when describing it, you took it or considered it as a whole, did you not—the series?

A. I think I described them as a whole, and also as to the separate parts. I think so.

Q. You described them both ways?

A. I think so.

Q. In your opinion it should be treated as a whole, should it not? A. No, I don't think so.

Q. You would take each separate strata of the rock and consider that separately, would you, in determining the question whether or not it constitutes—there is a vein or lode?

A. I think you will have to consider them both ways, both as a whole and as to the separate parts



(Testimony of Fred B. Weeks.)

which make up the [786] whole.

Q. In determining that question?

A. In determining the question, yes, sir.

Q. Assuming that the whole series constitutes a vein or lode, and that the time will come when these several strata of phosphate rock can be mined at a commercial profit, in the mining operations sorting would be required, would it not?

A. There are some of the beds in which sorting would be required; in some of it it would not be required.

Q. There would be also encountered foreign material in the other intervening strata that you have described?

A. As the question is asked there would not be foreign material encountered.

Q. Your answer seems to indicate that if the question were asked in some other manner your answer might be different.

A. The answer to the question hinges on the word "foreign."

Q. Oh. What would you substitute for that word—in classifying it?

A. I don't think I could substitute one word to take the place of it. I would have to explain what I mean by "foreign," and I don't think one word would explain it.

Q. I see. I mean material other than the phosphate rock.

A. You would encounter other material than the calcium phosphate. Yes, I would say you would

(Testimony of Fred B. Weeks.)

encounter other material than the phosphate rock.

Q. Throughout the intervening layers is there found tricalcic phosphate?

A. I think there is some tricalcic phosphate in all the intervening layers. [787]

Q. In all the intervening layers? A. Yes.

Q. Of some percentage? A. Yes, sir, I think so.

Q. How far does the ore in the Park City, in the limestone formation, continue on the dip of the beds?

A. As I have already stated, as far as my knowledge goes the statement that was made that it extends eight miles on the dip would be correct.

Q. You evidently don't understand the question. I was referring to the ore mined—the lead-silver ore? A. In Park City, Utah?

Q. Yes? A. I don't know.

Q. The formation there you know to be continuous on the dip, do you not?

A. Why, I know it to some extent, yes, sir.

Q. It may go on and on indefinitely for all you know?

A. Oh, yes; it goes on until it comes to an end. All formations, of course, have an end; but I don't know what length would be the end of it.

Q. Yes, all formations; and you are not able like Mr. Breger to tell us for 100 square miles, or 100 miles square?

A. I think I have already testified to what I consider the extent of this phosphate bed; but I don't know the extent of the lead-silver deposits.

(Testimony of Fred B. Weeks.)

Redirect Examination.

(By Mr. BUDGE.) [788]

Q. Who is your authority, Mr. Weeks, for the statement that this phosphate bed extends eight miles on the dip?

A. The Director of the Geological Survey, George Otis Smith.

Q. In speaking if this whole series were mined, or if the time should come that it ever was mined, that other materials would be encountered; do you mean that other materials in the various layers of calcium phosphate would be encountered, or materials which exist in layers or beds between those various layers of calcium phosphate?

A. I think it would be in both places; and to make that answer clear I would say—

Q. You may explain it.

A. I would say that in the lower main bed of phosphate there would be no foreign materials, or other materials, rather, encountered; in the other layers of the phosphate series, during the process of sedimentation of those layers, clayey materials were brought in and deposited at the same time that the phosphoric acid was deposited; and in those layers you would encounter those clayey materials.

Q. And as a matter of fact it is for that very reason that these beds above the lower beds are not of commercial value?

A. Yes, sir; they are not of commercial value at the present time.

Q. And at this time no other bed than the lower bed is mined?      A. No, sir, no other bed is mined.

(Testimony of Fred B. Weeks.)

Q. And that is true upon all these claims in question? A. Yes, sir. [789]

Q. Now, I will ask you, Mr. Weeks, if you have any notes showing the width of these various layers in the series—the width of the several beds, as shown on Defendant's Exhibit 4? Give us the width of the calcium carbonate and the width of the several layers above it.

A. The thickness of the main phosphate bed, as shown on Defendant's Exhibit 4, is 5 feet and 5 inches. The thickness of the bed of limestone overlying this main phosphate bed, in this section on Defendant's Exhibit 4, is two feet.

Q. Just a minute. I will ask you, Mr. Weeks, to mark in on this Defendant's Exhibit 4 these figures as you give them, stating the widths of these different beds.

A. The phosphate layer which overlies the limestone marked two feet, is two feet and two inches in width. The limestone which overlies the phosphate bed marked two feet and two inches is 18 inches in thickness. The phosphate bed overlying the limestone bed marked 18 inches is 16 inches in thickness. I could not give the exact thickness of the other beds without referring to my notes.

Q. Have you your notes with you?

A. I have not. I can furnish them so that I can finish this—this thickness. My notes are at the hotel.

Q. All right. We will just have you clear that up. Now, Mr. Weeks, I think you have stated—well,

(Testimony of Fred B. Weeks.)

I will ask you the question again: Do you consider this five-foot bed of calcium phosphate a vein or lode?

A. No, sir.

Q. Now, would you consider a five-foot fissure containing valuable deposits of apatite a vein or lode? [790]

A. I think so.

Q. Now, would you consider a five-foot vein of—a bed, rather, of coal, a vein or lode?

A. I don't think so.

Q. Would you consider a five-foot fissure containing valuable deposits of graphite or diamonds, a vein or lode?

Judge DEY.—What is the last word?

Mr. BUDGE.—A fissure containing valuable deposits of graphite or diamonds.

Judge DEY.—Oh—diamonds?

Mr. BUDGE.—Diamonds, yes.

Judge DEY.—That is what I couldn't understand.

Mr. BUDGE.—Q. —a vein or lode?

A. I think so. If it had the structure and form of a vein or lode it would have to be classified as such.

Q. Now, coal and graphite and diamonds, they are different forms of carbon, are they not?

A. Yes, sir.

Q. And calcium phosphate and apatite are different forms of what?

A. They are different forms of phosphate.

Q. Now, in this sorting process which you say might be necessary, if this entire series of phosphate beds were mined, would that sorting comprise simply



(Testimony of Fred B. Weeks.)

the taking out of the limestone nodules?

A. It would, in part, and in separating the shaly material from the phosphatic material as much as possible. [791]

Q. Now, Mr. Weeks, concerning these series, I will ask you whether these various beds of limestone and shale and phosphate rock are distinct from one another? A. Yes, sir.

Q. And have they all floors and roofs, the same as the lower bed?

A. That is true. What I mean by that, and by the statement that they are distinct and separate, is that each bed maintains its individuality as a bed wherever it is found, or wherever it has been exposed; that in no place do we observe the phenomena of the shale bed between two phosphate beds disappearing and the whole thickness taken up by the two phosphate beds; and in that way each bed is continuous for itself—has its individuality—and each is the floor and roof of the other, respectively.

Q. So that the roof of this bed of calcium phosphate which is mined, and which is the only bed of the series that is mined, has a roof? That bed has a roof of limestone two feet in thickness?

A. Yes, sir.

Q. And the basal limestone, the thickness of which is not yet determined—is not determined?

A. No, sir.

Q. And at present none of the material above the two-foot bed of limestone which is over this lower

(Testimony of Fred B. Weeks.)

bed of phosphate, is of any economic or commercial value?

A. No; it has no commercial value whatever.

Q. And is not necessarily taken out or mixed with the lower bed in the mining of the same? [792]

A. No, sir.

Q. Or in the use of the same? A. No, sir.

Q. And in mining the bed that is mined, there is no sorting process to eliminate any of the these materials of these upper beds? A. No, sir.

At this time a recess was taken until this afternoon at two o'clock. [793]

At two o'clock P. M. the hearing was resumed.

FRED. B. WEEKS, a witness heretofore called in behalf of the defendant, and duly sworn, being recalled in behalf of the defendant, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. Calling your attention to the Defendant's Exhibit 4, Mr. Weeks, did you find your notes which give you the thickness of these other strata?

A. Yes, sir.

Q. You may fill them in on the exhibit—the width of these strata which you have not marked—the width of which you have not marked so far.

A. Shall I read each one, or simply enter it?

Q. Just read it as you enter it, commencing with the shale above the 16-inch layer of phosphate.

A. The two upper layers that I have marked I

(Testimony of Fred B. Weeks.)

want to change them slightly, to correspond exactly to my notes.

Q. All right.

A. The other being given from memory. The bed of limestone which overlies the two-foot two-inch layer of phosphate is 15 inches in thickness, instead of 18.

Q. All right.

A. The bed of phosphate which overlies the limestone marked 15 inches is 11 inches in thickness. The bed of shale [794] which overlies the 11-inch phosphate is 16 inches in thickness. The bed of phosphate which overlies the 16-inch bed of shale is twelve inches in thickness. The bed of limestone which overlies the 12-inch bed of phosphate is six inches in thickness. The bed of phosphate which overlies the 6-inch bed of limestone has been eroded, so that it varies in thickness from three to six feet, according to the amount of erosion which has taken place at the top of the bed.

Q. What is the width of it where it is not eroded, Mr. Weeks?

A. I think the maximum thickness is six feet. That is the greatest thickness I have ever seen of it.

Q. What is the percentage of calcium phosphate in that top bed? A. I don't know.

Q. Well, is it commercially valuable?

A. Yes, sir.

Q. At this time—for the purposes for which the lower bed is used?

(Testimony of Fred B. Weeks.)

A. I couldn't state, because I don't remember the amount of phosphoric acid contained in that bed. I know that the bed is shaly in character; but just the composition, to state whether it is commercial or not, I couldn't say.

Q. You mean to say whether it is commercially valuable or not?

A. No. I am inclined to think that there is so much shale in the bed that it reduces the amount of phosphoric acid below the point where it would be commercially valuable. I think so. [795]

Q. Now, Mr. Weeks, on cross-examination you stated, if I remember the testimony correctly, that if there were a fissure containing apatite, or a deposit of apatite—a fissure containing this apatite in its entirety—that it would probably be a vein or lode; but if it contained only a portion—of phosphorite, instead of apatite,—contained only a portion of phosphorite, that you thought it would not be a vein or lode. I want to ask you if you desire to correct your testimony in that respect?

A. I think I was considerably confused in answering those questions; and what I would say at the present time is, that if a fissure containing or made up of this phosphorite in its entirety, it would not be located as a vein or lode, because it was not metallic, and because it did not contain any gangue mineral or material from which the valuable part would be extracted.

Q. But would be mined as a whole?

A. Yes, sir. But if the fissure was formed of phos-

(Testimony of Fred B. Weeks.)

phorite in part and contained other materials from which the phosphorite would be extracted, it might be a question then as to whether it should be located as a vein or lode.

Q. What is the probability, as compared if the whole fissure was phosphorite?

A. Why, there would not be that doubt in my mind.

Q. There would not be the same doubt?

A. No, sir.

Q. For what reason?

A. Well, for the reason that the fissure being completely occupied by this phosphorite, the material would be mined as a [796] whole, and there would be no gangue present from which to extract the valuable material.

Q. While you were on the survey—the United States Geological Survey—throughout your experience of 18 years, was it customary for the officials connected with the survey, in making examinations of mining properties, to make inquiries and obtain information of mine owners and mine foremen, and assistance from them in the inspection of their properties, etc.?

A. Yes, sir, that was always the custom. I have myself written many letters asking for such information, and have obtained such information from mine owners and mine managers and foremen, and practically everyone connected with such works. I know that it is the custom to ask for letters of introduction where a man going into the country was a stranger to the people. I have written such letters, which



(Testimony of Fred B. Weeks.)

have been signed by the Director himself, for that purpose.

Q. During the time that you were on the geological survey, Mr. Weeks, did you have any interest, present or prospective, or have you since had any interest, or do you now have any interest, in any of these phosphate deposits?

A. I never had any interest in any phosphate deposit of any kind, in any place, either during my connection with the survey or up to the present moment, and I have now no interest in any phosphate mine or location of any kind.

Q. Have you any business or association or connection of any kind with Mr. Ferrier, who joins with you in this report which has been referred to, or with his company, the San Francisco Chemical Company? [797]

A. I have never had any business connection with M. Ferrier in any way. I knew Mr. Ferrier as a geologist on the Canada Survey for a good many years before we met at Montpelier; and I have never had any business connection with the San Francisco Chemical Company until January or February of 1911.

Q. Were you at any time—well, I will ask you since you have had anything to do for the San Francisco Chemical Company, have you received any pay from the Government, or been in its service in the Geological Survey, or any other department?

A. No, sir, I never have. The last pay I received from the Government for work was on the first of

(Testimony of Fred B. Weeks.)

March, 1910. That was when I closed my service with the Land Office. My name was carried on the rolls for several months after that, but I never did any services and never received any pay after the first of March, 1910.

Q. And you were not, after the first of March, 1910, under the supervision of the Geological Directors?

A. No, sir.

Q. The Director of the Geological Survey?

A. No, sir, nor any other Government officer.

Q. Is there any deposit, Mr. Weeks, of which you know as a geologist or mining engineer, exactly similar to this phosphate deposit; or is it a deposit which is something different from any known deposit, up to the time of its discovery?

A. We have no deposit which is exactly similar to the phosphate deposits. I think the deposit which conforms most nearly to the phosphate deposit is that of the coal deposits of the Eastern and Middle States, from Pennsylvania to Alabama, [798] and extending through the Ohio Valley and Mississippi Valley States, there was a great deposit of coal, at the same geological period that the phosphate deposits were laid down.

Judge DEY.—I submit that this is not proper redirect.

Mr. BUDGE.—It is not quite responsive, that is correct; but I wanted to ask it, anyhow.

Q. Just go on with your explanation, and make it as brief as you can.

A. This coal area was characterized by an abun-

(Testimony of Fred B. Weeks.)

dant plant life. In the Western States during the same period of time there was a deposit of carboniferous strata, in which was a great amount of animal life, and in which the phosphate beds covering the area which I have described were laid down.

Q. Both of the same age?

A. These are the same age, and in a broad way they resemble each other.

Q. In the upper carboniferous age?

A. Yes, sir.

Q. Now, some of your reports have been referred to, Mr. Weeks, and you were asked on cross-examination if you published or caused to be published these reports, I think designated as Bulletin 340, published in 1907, and another report which is a part of 430-H, if I am correct.

(Handing report to witness.)

A. No; this is not the right one.

Q. Here it is. It is the bulletin on phosphate. Is that the one?

(Handing same to witness.) [799]

A. Yes.

Q. It is entitled "Investigations relating to Phosphates and Phosphorous, by the United States Geological Survey," published in 1906 as an extract from Bulletin 315. Now, under whose direction did you publish those reports?

A. Under the direction of the Director of the Geological Survey.

Q. Did he require you to do that?

A. My letter of instructions required me to make

(Testimony of Fred B. Weeks.)

those investigations and submit a report upon the same.

Q. And did he require you to publish it—request that you publish it?

A. That went without such request, because when it was turned in it was published, necessarily under his direction. I had nothing to do with the publishing of it.

Q. Oh, I see, and you didn't have it published yourself? A. No, sir.

Q. All you did was to submit the report?

A. Yes, sir.

Q. I want to call your attention just for one question to these Sage deposits: Do you know how they would be mined?

A. A considerable portion of them could be mined by stripping off the surface, and mining it in an open quarry.

Q. Is that the only way that portion could be mined? A. Yes, sir.

Q. And is it in that respect like the deposits—some portion of the deposits within the claims in controversy, that the mining of it would depend upon the particular locality from which you desired to take the deposit? [800] A. Yes, sir.

Q. From what you have observed, is there in any of these localities in this deposit any indication of any of these beds or strata pinching out, and being replaced by the one above or below? A. No, sir.

Q. They all maintain their individuality throughout the series? A. Yes, sir.

(Testimony of Fred B. Weeks.)

Q. How many days in all, Mr. Weeks, have you estimated that you spent on the ground in the examination of these phosphate deposits in question?

A. In the year 1906 I spent—

Q. Just all together?

A. Between 25 and 30 days.

Q. You stated on cross-examination that antimony was not a metal, I think. Is that correct?

A. No, sir.

Q. Do you wish to correct your testimony in that respect? A. Yes, sir. It is a metal.

Cross-examination.

(By Judge DEY.)

Q. Have you anything further to say since the noon recess as to whether or not arsenic is nonmetallic? A. Nothing further.

Q. Where did you get your information from with reference to the Witwaters rand? [801]

A. I have read several of the publications which describe it.

Q. Just name them. Just tell us how you got your information.

A. One is a publication by John Hays Hammond in a volume of the proceedings of the American Institute of Mining Engineers for the year—I can't give the exact year; it is about 1904.

Q. Yes. What else?

A. I don't recall the others. I remember this because I have read it and looked it over several times in the past two months.

Q. Well, the information from which you testified



(Testimony of Fred B. Weeks.)

was derived, if I understand it, from the publication by John Hays Hammond?

A. Essentially so. I had the general idea in my head before.

Q. Did you find on your visits and investigations at Park City that there are dikes cut across which displace the vein? A. I think so.

Q. They were of later occurrence than the vein, were they not? A. Probably.

Q. What is galena? A. Lead.

Q. What is the composition?

A. It would depend upon the form that it was in.

Q. Cube galena?

A. The metallic form of lead. [802]

Q. What is the composition—what elements?

A. It would be lead, with whatever other material it was combined with.

Q. You couldn't state now the elements that enter into the composition?

A. Other than I have stated.

Q. Eh? A. Other than I have stated.

Q. Well, it is never pure, is it?

A. No, I think not.

Q. Eh? A. It might be native lead.

Q. Crystallized galena, is it ever pure?

A. I have never seen it in that form.

Q. You don't know of its existence in pure form, do you?

A. No. As I have said, I have never seen it in that form.

Q. Now, won't you please give the different per-

(Testimony of Fred B. Weeks.)

centages of the different elements in galena, from the mineralogy which you have studied?

A. I have studied it, but I don't have it in mind at the present time.

Q. You are unable to say? A. No, sir.

Q. Are you able to state any of the elements other than lead? A. No, sir.

Q. Can't you state the next most important element? A. No, sir. [803]

Q. You were referring to similarity a few moments ago. Have you ever seen two veins exactly similar? A. No, not exactly.

Q. They are never just alike?

A. I don't know of any that are just exactly alike.

Q. Now, in the walls of this deposit which you have described, or vein, is there any phosphoric acid?

Mr. BUDGE.—Do you mean, Judge, the walls of the lower bed, or the walls of the series?

Judge DEY.—The bounding walls and the series.

A. I don't know that either the upper or lower limestones of the series contain phosphoric acid, or calcium phosphate either.

Q. You don't? A. No.

Q. Didn't you so previously testify?

A. I don't think so. If I have I didn't intend to say so.

Q. Have you never had an analysis made to find out? A. No, sir.

Q. You stated that you found it in the intervening strata?

A. Yes, sir. The limestone which forms the roof

(Testimony of Fred B. Weeks.)

of the main bed has been analyzed, and reported to contain phosphoric acid, and I believe it does.

Q. It has? And the separating strata also contains phosphoric acid? A. Yes, sir.

Q. All of them? Each and all of them? [804]

A. I think so. Each and every one of the beds comprising the series contains phosphoric acid.

Q. And the footwall underlying the lower phosphate rock also contains phosphoric acid, does it not?

A. I have never seen a chemical analysis of the rock, so I don't know.

Q. You don't know anything about that?

A. No, sir.

Q. You made no investigation as to that?

A. No, sir.

Q. You had just referred to the hanging-wall of the series? A. Yes, sir.

Q. In one of your answers?

A. Yes, sir. I don't know of the presence of the phosphoric acid either in the rock, in the limestone that overlies the phosphate series nor in the limestone that underlies the phosphate series. I don't know of the presence of phosphoric acid in either of them.

Q. But you have seen analyses that have been made from the hanging-walls of the series? A. No, sir.

Q. Oh, I understood you— A. No, sir.

Q. I understood you had.

A. No. I will not say that I had not.

Q. Well, why did you make no investigation to ascertain whether or not it carried phosphoric acid?

[805]

(Testimony of Fred B. Weeks.)

A. The limestone that overlies the phosphate series is a very cherty, silicious limestone, and from its appearance one would not be led to believe that it contained any valuable materials, such as phosphoric acid. (*Separation*) LAJ.

Q. In even small quantities?

A. Why, it may readily contain small quantities. A great many limestones contain phosphoric acid.

Q. Well, that is what I am asking, is about that over-hanging limestone.

A. I am not saying that it does not contain phosphoric acid. I simply don't know. I have never seen a chemical analysis of the rock.

Q. You have no reason to believe that it does not—

A. No, sir.

Q. —contain some percentage of phosphoric acid?

A. No, sir.

Q. Now, you were asked something about the commercial value of the phosphate rock lying in the series above the bed series, and in that connection referred to future use. Do you know all about future use? A. No, sir.

Q. You don't? A. No, sir.

Q. Do you know anything of the future use?

A. I might have some ideas about it, sure.

Q. Do you know down in the Mercur District there in Utah, that gold camp, that cyanide brought the unexpected future use? A. Yes, sir. [806]

Q. And even you are unable to state what may happen? A. No, sir.

Q. In the economical reduction, or mining, or

(Testimony of Fred B. Weeks.)

transportation, or anything else that enters into the production and use of it in the future?

A. No, sir, only such ideas as I may have.

Q. It is, Mr. Weeks, to the past rather than to the future that you state with certainty?

A. Usually.

Judge DEY.—Yes. That's all.

### Redirect Examination.

(By Mr. BUDGE.)

Q. And also the present? A. Yes, sir.

Q. And in all of these beds or strata overlying this commercially valuable bed, none of them contain phosphoric acid in sufficient quantity to make them at the present time of commercial value?

A. No, sir.

### Recross-examination.

(By Judge DEY.)

Q. Mr. Jack wants me to ask one more question: When you entered the employ and performed the first service for the San Francisco Chemical Company, was there any other company operating phosphates in Idaho or Utah or this section, that you were connected with, prior to your connection with the San [807] Francisco Chemical Company?

A. In no way, except as I have stated with regard to my visit to Judge Richards.

Q. What company was that?

A. The Union Phosphate Company.

Q. And after that visit to Judge Richards were you in their service? A. No, sir.

Q. At all? A. Not at all.



(Testimony of Fred B. Weeks.)

Q. Acting in litigation? A. None whatever.

Q. As a witness? A. No, sir.

Q. Eh?

A. No, sir, not until the time that I acted as a witness for the Union Phosphate Company in their case in the winter of last December.

Q. Last December?

A. I don't remember whether it was December or not, but it was recently.

Q. Had that service anything to do with your resignation from the Government?

A. No, sir, absolutely nothing.

Judge DEY.—That's all.

Mr. BUDGE.—Q. In view of the fact that there has been some extracts read in regard to phosphorite from the Encyclopaedia Britannica, I will ask you, Mr. Weeks, whether Bryner and Newsome are recognized authorities on economic geology? [808]

A. Yes, sir.

Q. Who is Bryner? J. C. Bryner, is it?

A. J. C. Bryner is now Vice-president of the Stanford University, and Professor of Geology.

Q. Who is Newsome?

A. Newsome is a professor of geology in the same university.

Q. John F. Newsome? A. Yes, sir.

Q. Calling your attention to page 320 of Bryner & Newsome's Syllabus of Economic Geology, I will ask you what definition is there given of phosphorite?

A. (Reading:) "Phosphorite includes the vitreous, earthy, scaly and fibrous forms of apatite. It

(Testimony of Fred B. Weeks.)

is found in Spain, Germany, and near Bordeaux, France, in veins and pockets. Not found in United States."

Mr. BUDGE.—That's all.

Judge DEY.—Q. Is it an allotropic form of apatite? A. I think so.

Judge DEY.—That's all. [809]

**[Testimony of Robert N. Bell, for Defendant.]**

ROBERT N. BELL, a witness called in behalf of the defendant, being first duly sworn, testified as follows, to wit:

Direct Examination.

(By Mr. BUDGE.)

Q. What is your name? A. Robert N. Bell.

Q. Where do you reside? A. In Boise, Idaho.

Q. How old are you, Mr. Bell? A. I am 47.

Q. What is your present occupation?

A. I am State Inspector of Mines.

Q. For what State? A. Idaho.

Q. And how long have you held that office?

A. Well, during the present term since the beginning of January of this year; and prior to that I held the position for three successive terms of two years each, between 1903 and 1909.

Q. Is that an appointive or an elective office, Mr. Bell? A. An elective office.

Q. What business did you follow prior to the time you were elected State Inspector of Mines?

A. Well, for some time prior I followed the business of mine valuer.

(Testimony of Robert N. Bell.)

Q. What is a mine valuer?

A. Just examining and reporting on the value of mining property for investors. [810]

Q. Passing on the property as to its value as an investment? A. Yes.

Q. And how long did you act as a mine valuer, and in what States?

A. Well, an indeterminate length of time. I commenced looking up properties for people say back about 1899, and probably occasionally before that.

Q. How is that?

A. Before that I was prospecting and developing and handling claims of my own, and acting as foreman and superintendent, is my recollection.

Q. When did you first become interested in any way in mining? A. Why, in 1883.

Q. Where?

A. In the west end of the Bozeman tunnel on the Northern Pacific Railway, and graduated from a mucker to a check tender and timberman's helper, in that piece of railroad work—one of the finest pieces of underground work that was ever accomplished in the west, I guess.

Q. And after 1883 what was the nature of your work, as far as mining was concerned?

A. I worked for nearly a year as a coal miner after that, for the Northern Pacific Coal Company, at Timberline, Montana.

Q. In what capacity?

A. As a coal miner—digging coal by the ton.

Q. And subsequent to that what did you do?  
[811]

(Testimony of Robert N. Bell.)

A. I worked for short periods at the Drum Lummon mine at Marysville; at the Weeks smelter in Montana; and for about two months on the Anaconda Hill in Butte; and came to Idaho in 1885.

Q. Prior to coming to Idaho what was the nature of the mining properties which you were employed upon? A. Coal, gold, silver, and copper.

Q. Lodes or placers? A. Both.

Q. Both?

A. I worked one season in a hydraulic placer mine near Helena, for about six weeks.

Q. A gold placer? A. Yes, a gold placer.

Q. After coming to Idaho in 1885 what did you do?

A. I worked in the quartz mines of the Salmon River country—for quartz mines principally, and placer mines occasionally.

Q. In what capacity there?

A. As a miner—a hard-rock miner.

Q. Hydraulic?

A. Hard rock. It is generally pretty hard rock.

Q. And how long did you continue at that, Mr. Bell? A. About four years.

Q. During any of the time that you have mentioned either while in Montana or Idaho, were you engaged in work as a prospector?

A. Yes. After my quartz mining experience in Idaho, the first four years, I prospected then for a number of years. [812]

Q. In what districts?

A. Well, principally in the Salmon River country, in Lemhi and Custer counties, and with several ex-

(Testimony of Robert N. Bell.)

cursions into Montana, and I found and developed a small vein or say of a number of gold quartz properties and placer claims.

Q. How long were you engaged in work as a hard-rock miner?

A. Oh, about nearly—for day's pay, a little over four years.

Q. And how long prospecting?

A. Oh, prospecting and odd jobs of handling small crews of men, for ten to twelve years.

Q. Did that ten or twelve years cover the time when you acted as a foreman? A. Yes.

Q. And in what mines do you now recall where you acted as foreman? A. The Brigand mine.

Q. Where is that?

A. It is in the Leesburg District, in Lemhi County. And the Shoo-fly mine, in the Leesburg District. In the Lone Star mine, for Henry Walcott, of Denver, in the Sandy Creek District.

Q. Any other places?

A. Well, I handled a few men for myself on the Midland Belle mine.

Q. Where?

A. In the Wallace Creek District, in Lemhi County. [813]

Q. And any other experiences in mining other than those you have related, or any other districts in which you have operated as a practical miner?

A. Well, I have visited a good many mines up to that time, and all the principal mines of Custer County, and some of the Blaine County and Wood



(Testimony of Robert N. Bell.)

River, and some of the Butte mines, and read a good deal on the mining and geological subject—all I could get a hold of, in fact.

Q. Are you a geologist?

A. No. I never had any organized college experience at all, excepting as I have stated. I have studied the geological reports from the principal leading geologists of the United States and other countries, and text-books on the subject. I might say that I am a student of geology.

Q. Now, how many years, then, Mr. Bell, have you held the office of State Inspector of Mines?

A. I held the office from January, 1903, till December, 1908—six years.

Q. Six years—

A. —and six months of this year; and during that experience, of course, it has broadened my ideas a great deal. I have had the advantage of visiting a majority of the largest mines in Idaho and Montana and Utah and parts of Nevada, and have made a comparative study of the methods of ore deposition, and occurrence, etc.

Q. What are your duties as State Inspector of Mines?

A. I am required to visit each mining county in the State at least once each year, and such mines, or such operating mines therein as in my discretion would need inspecting and looking [814] after. I also have to gather statistics of output, and make a tabulated report of the vital statistics, and also to in a measure promote and advertise the mineral resources of the State.

(Testimony of Robert N. Bell.)

Q. Do you claim to be familiar, Mr. Bell, with the various mining properties of different kinds throughout Idaho? A. Yes, sir.

Q. Are there any important properties or working properties in Idaho which you have not visited?

A. No, I believe not.

Q. And in addition to the inspection of these properties have you inspected mining properties in other States, to any extent? A. Yes, sir.

Q. What particular properties? In what State?

A. Well, in Montana, principally the Butte mines, the Anaconda, and St. Lawrence, and Butte and Boston, and the Boston and Montana properties as a guest of the management, also as a guest of the mine inspectors up there, Mr. Oram and Mr. Welch, at different times; and in Utah I have examined the Daly-West a number of times.

Q. Where is that? A. At Park City.

Q. Yes?

A. Also the Silver King a couple of times, and part of the Ontario, and the— If you can help me out on the name of that mine, Mr. Breger?

Mr. BREGER.—The Conklin?

WITNESS.—No, not the Conklin—right up [815] the gulch from the old Ontario boarding-house.

Mr. BREGER.—Oh—the Wabash?

A. Yes, the Wabash. I made a report on that. That underlies the famous Park City quartzite region that carried so much silver—lead ore—silver ore. In Tintic, also, I have examined the east side mines, the

(Testimony of Robert N. Bell.)

Yankee-Con., and the Beck Tunnel, the Colorado, and the Sioux, and Iron Blossom; and in Stockton, the Bullion, and another mine adjoining it—I forget the name of it—a large mine.

Judge DEY.—Q. The Honorine?

A. The Honorine, yes, when they were running a tunnel there. I never was in the Mercur. I have been down in the Santaquin District and examined the Sioux Chief, which is only a small property, but it is in a very interesting geological relation to Tintic. In Nevada, the most important investigations I made there was in the Pioche District, in the Raymond-Ely group, the old mines, as far as they are accessible, and in the Prince Consolidated, and the Susan Buster, all of which carry large ore bodies in rather unusual modes of occurrence. In Wyoming I have examined coal mines, the Rock Springs No. 1 from top to bottom, and the Kemmerer 1 and 2, I think.

Mr. BUDGE.—Q. Well, from your experience in the examination of these properties, and from the performance of your duties as State Mine Inspector, what have you to say as to your opportunities of acquiring information as to the nature of the deposits in these various places throughout the west, and as to the manner of occurrence of these deposits? [816]

A. I think I have had exceptional opportunities for observing the modes of occurrence of ore bodies. In fact, I think the States I have mentioned, in which I am more or less familiar with ore deposits, contain some of the finest examples of ore deposition that is to be found anywhere in the world.

(Testimony of Robert N. Bell.)

Q. And your association has been in a great measure with geologists? A. Yes.

Q. And mine inspectors?

A. Yes. It rather involves considerable knowledge in a general way of the subject, to be able to publish a report that will be intelligible to miners and laymen, and sometimes to criticize the mistakes of more professional people, where they interfere with the practical phase of the question.

Q. Now, Mr. Bell, calling your attention to the deposits of phosphate rock, or of rock phosphate, included within the boundaries of the claims shown on Defendant's Exhibit 2 and Plaintiffs' Exhibit 1, I will ask you whether you have ever made an examination of these deposits?

A. Yes, sir. I examined these deposits in question, the first time on the 24th of May—the 24th or 25th of May, of this year.

Q. Any other time?

A. One day after that. I will have to look at my note-book.

Q. The 16th of June, wasn't it?

A. The 16th of June, yes, that's right—the 16th of June.

Q. What was the nature of the examination you made? [817]

A. Why, I went in company with Mr. Taylor and Mr. Weeks to the Waterloo mine, and went through the development of it first, and after that over the outcrop of the deposit its entire length, as far as it can be traced on the surface, from the Waterloo mine

(Testimony of Robert N. Bell.)

to the north end of the property—very nearly to the north end of the last placer claim in the group, and beyond the north end of the Obed lode claim.

Q. And what sort of an examination did you make?

A. Why, quite a careful examination of the underground feature of it, by reason of the fact that it was my first visit to it and the first time I had seen that character of mineral in a developed form underground.

Q. Did you study the mode of occurrence?

A. Yes.

Q. And position of the deposit?

A. Yes. We entered the mine from the lower opening, a cross-cut tunnel about 125 feet long, of which probably 100 feet was in solid formation, the outer 25 feet being in surface debris, that was timbered through, and the 100 feet in this cross-cut tunnel was a succession of alternating layers of shale and lime and phosphate material, to the bottom. Also, next to the lower limestone bed there was a five-foot bed of clean phosphate rock, of oolitic structure, with a decided band of black lime, highly fossiliferous overlying it, standing at an angle of about 30° and with a strike north and south and a dip west. It had been opened by entries driven north and south several hundred feet each way. I went to the face of both entries, and the men were still drifting east—two men [818] working in the face, one of them was drilling holes with a breast augur, such as is used in a coal mine. The structure of the five-foot bed of phosphate was very similar to a bed of coal—a pitch-



(Testimony of Robert N. Bell.)

ing vein of a bed of coal. It had a kind of a laminated or shaly structure, due to the deposit lines of the mineral or some subsequent compression, a very smooth roof and floor, and an occasional rounded creation or niggerhead, which is a common occurrence in a coal vein. The mineral was black, and the walls were black, and it looked very much like a coal vein. In fact, going through there, before the examination was completed, it recalled very vividly the only coal development we have in Idaho. We have a five-foot coal vein in Fremont County, a pitching vein, with roof and floor of sandstone, in a cretaceous series, on the west side of Teton Basin, that is opened by a similar cross-cut tunnel and has got an entry driven each way from the cross-cut tunnel, 500 feet and excepting for the lack of luster in the mineral it looked very much the same.

Q. Are you personally interested in that coal mine?

A. I am, yes, sir. I have been endeavoring to develop it for several years. We went to the south face first, and then back past the cross-cut entry tunnel, to the north face, and noted one or two rooms that had been started up on the pitch of the bed, and two raises or chutes through which the material had been brought down from a higher level. At the north end—

Q. This is the phosphate bed you are describing now?

A. The phosphate bed I am back on now. You asked me that.

Q. Yes—that's right. [819]

(Testimony of Robert N. Bell.)

A. At the north end of the Waterloo development, in the lower tunnel, a new raise had just been put through to an upper tunnel or entry, and we climbed through that raise or rock chute, or whatever you would call it, and found ourselves on the upper level or entry. That proved to be about 450 feet long, which we followed out to the surface, where it had been driven in from a point at a quarry, where the mineral had formerly been quarried on the surface, by stripping off the overburden of earth. This upper entry had several rooms driven up on the pitch of the bed, with short pillars left above the entry to protect it and save timbering, and the material had been mined out, and the roof propped as they do in coal mines, to prevent the falling of rock. At the mouth of the upper entry the bedded structure of the deposit is very well defined, and disclosed by considerable work of cutting and stripping for quarry purposes, which had exposed quite a little segment of the series. Also, the underlying limestone had been cut into, and showed a very excellent section of the main phosphate bed—the five-foot bed—with a rather massive underlying limestone, showing some weathered outlines of fossils in the five feet of phosphate rock of oolitic structure, and in two feet also—20 inches to two feet of very fossiliferous limestone, which they called the cap lime, that overlies the five-foot bed, and was conspicuously full of colored fossils, which on the under side of the bed made impressions in the upper layers of phosphate rock. From there we climbed up through the area that had been quarried, and which I

(Testimony of Robert N. Bell.)

was informed had produced about 5,000 tons of phosphate rock, and examined the stakes of the Maury lode claim, I think.

Q. Now, calling your attention to that area within the [820] Waterloo mine that has been mined, and which is now propped up as you have described; what is the approximate area, Mr. Bell?

A. That has been roomed out?

Q. Yes. A. Above the upper entry?

Q. Yes.

A. Oh, we didn't climb to the back of the rooms, you know. I should judge, though, that the total area—there are several of those rooms had been started up, and back of the entry all the way along is mostly ceiled—they have left a pillar there to protect the roof—

Q. I am talking about that portion of it that opens out—well, it really doesn't open out, but there is an aperture from the part that is mined out, out into that place where there has been quarry work done.

A. Well, I should judge that, at a guess—I didn't go through it; you couldn't get through—there might be 100 feet square.

Q. Mr. Bell, from your experience, do you claim to be familiar with the different methods of mining?

A. Yes.

Q. In the State of Idaho, and Western States?

A. Yes, sir.

Q. And with the method of treating ores?

A. Yes, sir; in a general way.

Q. And minerals? A. Yes.

(Testimony of Robert N. Bell.)

Q. Now, did you, on the 16th day of June, 1911, in company with Mr. Weeks, go over this ground embraced within the boundaries [821] of these claims as shown on Defendant's Exhibit 2, to ascertain the position of the highest exposure of the phosphate bed?     A. Yes, sir.

Q. And calling your attention to the Defendant's Exhibit 2, I will ask you to state whether this black line correctly indicates the position of the outcrop of the beds at the highest points?

A. Yes, sir; I think it does. I went over that particular feature of the property with Mr. Weeks and Mr. Breger, and examined every one of the pits exhibited on the black line. There were little spots or places where the deposit had been opened by shallow pits, cuts or tunnels, and we traced that outline as it is shown there, which would really steal the apex right of one-third of the Obed claim, if it were located as a lode.

Q. Well, how do you account, Mr. Bell, from your examination of this area shown on this map exhibit 2, for the irregularity of this black line which indicates the outcrop?

A. Why, it is due to the folding of the strata and its subsequent erosion in an irregular manner.

Q. Now, calling your attention to this feature of it, from the Obey lode and the Wilmington placer to the Overton lode, the Cumberland lode, and down in the Winter placer; in what direction does the slope of the hill extend, does it extend from the Obey lode down to the Overton, or from the Overton the other way?

(Testimony of Robert N. Bell.)

A. It extends from the Obey lode down to the Overton. '[822]

Q. In other words, the Obey lode and the Wilmington placer are higher up on the mountain than the Overton and the Cumberland, that are down on the creek? A. Where is the Overton Placer?

Q. Right here. (Indicating.)

A. Oh, yes. Oh, yes; they are seven or eight hundred feet higher, vertically.

Q. And on the other side of the map the Wizard placer is higher to the east than the Mount Pleasant lode? A. Yes.

Q. Now, what is the strike of this bed?

A. It varies a very trifle from the true north and south strike, at the north end of the properties shown, and the dip is quite uniformly to the west.

Q. Now, were you back on this map—or where appears on this map, rather, the curves of the black line extending toward the east? A. Yes.

Q. How do you explain those curves, as showing the outcrop, for example, as it appears running from the Arkansas lode down into the northeast corner of the Mount Pleasant lode?

A. That is due to the erosion of a tributary draw that runs into Montpelier Creek, and leaves on the swell between the draw and Montpelier Canyon rim a flat area with very little cover on of the five-foot phosphate vein.

Q. Now, calling your attention to the curves in this line which extend towards the west, such as the curve opposite the figures 2537, and the curve opposite the



(Testimony of Robert N. Bell.)

word "Hickman," and the curve opposite the figures 2538 on the Arkansas lode; and also [823] at this point, the curve opposite the figures 2538, as they appear in the Mount Pleasant lode; what do those curves extending westerly represent?

A. They are due to the inequalities of the outcrop, as caused by erosion of several different draws leading into Montpelier Canyon.

Q. These curves represent where the phosphate now runs?

A. Where the phosphate outcrops, to the edge of the bed in some instances, and to the other a fair representation of the apex.

Q. And the curves extending in towards the west from the Arkansas and Hickman lodes represent where the phosphate bed has been eroded, as I understand it?

A. Yes; those curves extending to the west represent the lowest points in the gulches or draws. Here is one on the line of the Tennessee lode. (Indicating.) The Tennessee lode seems to be laid out with the dip of the bed, and its side lines would be its end lines, and the extralateral feature would not amount to anything in that way.

Q. Now, I will ask you: Did you examine the boundary lines of these lode claims—the stakes?

A. A great many of them, yes. We haven't the numbers on the blue-print map, which was a copy, I think, of the Plaintiffs' Exhibit No. 1, isn't it?

Q. Yes, exhibit 1. A. Yes, exhibit 1.

Q. Well, from the examination you made there,

(Testimony of Robert N. Bell.)

were you able to observe the corners of these various lode claims? [824]

A. We visited several of the corners, and followed the outline of the bed over these claim lines, as shown.

Q. Did you follow the outcrop of the bed with particular reference to the corners and side lines of these lode claims?

A. Yes, sir. Pardon me, we didn't visit all the stakes of these lode claims; but the ones most involved we picked up, and found the numbers and location of them, and it is an open country and we could see the other stakes of most of the claims.

Q. Now, calling your attention to this curved line as it appears on the Arkansas lode, extending westerly by these various curves and angles down into the Mount Pleasant lode; calling your attention to that entire black line, I will ask you to explain the topographical condition there.

A. There are two draws—they can hardly be dignified by the name of gulches, because they are not deep enough, but they are deep enough so that they have eroded the phosphate series through to the underlying massive basalt line, the depth being anywhere from 100 to 200 feet.

Q. Describe where these gulches are, and designate them on the map so they can be understood in the record.

A. Well, one of them (the Tennessee Gulch, so named) lies between the south end line of the Arkansas lode and the north end line of the Hickman lode, and runs down the course of the Tennessee lode. The

(Testimony of Robert N. Bell.)

next draw is much shallower, and it runs more directly into Montpelier Canyon. It crosses the corner, or rather it runs down along the north end line of the Arkansas lode and across the Mount Pleasant. And in addition to that there is a little draw comes up in the center of the Mount Pleasant claim, which accounts for this exposure here (indicating), [825] there being more erosion back in here. (Indicating.)

Mr. JACK.—When you say “here,” Mr. Bell, the stenographer doesn’t get it.

A. That is true, too. I beg your pardon. There is a little draw runs back in towards the northeast side line of the Mount Pleasant lode, which exposes the bed where it has been eroded by that draw and by the main slope of Montpelier Canyon.

Mr. BUDGE.—Q. Now, this piece of county embraced within that crooked line that I have named, is a hill, isn’t it, Mr. Bell?

A. Yes; it is a part of the main Waterloo ridge there, or range.

Q. And in what way does that bed extend or dip, from where this line appears on the Arkansas lode?

A. It dips down in a direction parallel to the end lines of the Arkansas lode claim, and comes to the surface on the Mount Pleasant claim, as exposed by a series of cuts and outcrops.

Q. At a point how much lower down the hill does this exposure occur on the Mount Pleasant lode?

A. From the apex of it on the Arkansas lode?

Q. Yes?

(Testimony of Robert N. Bell.)

A. Why, I should say 1500 feet, a little more, towards the west end.

Q. Now, is there any other exposure of phosphate rock on the Mount Pleasant lode other than as mapped out in this map? A. I believe not.

Q. Did you see any other?

A. I didn't see any other. [826]

Q. And which way does that deposit extend from this point where it outcrops, in which direction?

A. It has been cut out entirely on this dip from the line shown, and it would extend uphill towards the Arkansas lode.

Q. In other words, there is no deposit of phosphate rock below that line dipping toward the creek, down the hill? A. I don't believe there is.

Q. Well, the dip of that bed, from your examination, was in which direction? A. To the west.

Q. Now, how are these lode claims—that is, to the west and uphill, or downhill?

A. Oh—the dip of the Mount Pleasant?

Q. Yes.

A. Well, that would incline uphill, to the northeast. Am I right about northeast there? No—southeast.

Mr. JACK.—No—southeast.

A. Yes, it is southeast. The map is lying on its side to me.

Mr. BUDGE.—Q. Calling your attention to these lode lines and lode claims, and the manner in which they are laid out and located, how are they located with reference to the strike of that deposit?

A. There is not a single claim that is laid out ex-

(Testimony of Robert N. Bell.)

actly on the strike excepting the Hickman; the others vary at considerable angle, and some of them along the dip rather than the strike; that is the one in particular, the Tennessee.

Q. The Tennessee is along the dip, you say?  
[827]

A. Yes.

Q. And how are they located with reference to the dip?

A. They quarter across the direction of the dip, most of them. The dip is west, and the claims are laid out on the northwest side of the Montpelier Canyon, in a northeasterly direction, and would involve considerable apex trouble unless they were amended and properly made to conform with the dip of the bed, if they ever proved to be valuable.

Q. Do you understand, Mr. Bell, from your experience, what is known as a vein or lode?

A. Yes. My impression or understanding of a vein or lode is a deposit of metallic mineral matter that has been injected into a pre-existing fissure or fracture in the earth's crust, and primarily derived from subterranean sources.

Q. You say that is an impression. Is that—

A. That is my experience.

Q. That is what you understand to be a lode or vein? A. That is what I understand; yes.

Q. And what do you understand to be a placer, Mr. Bell?

A. A placer is a deposit of mineral matter, loose or consolidated, under the construction of the law,



(Testimony of Robert N. Bell.)

that may be valuable for gold or tin or earthy minerals of various descriptions; also for gems and hydrocarbons.

Q. What is the difference, as you understand it, between the methods of deposition of a placer and a lode?

A. My understanding of the deposition and origin of a lode deposit is, that it is due to igneous action of some kind, as a result of a primary fracture in the earth's crust being [828] filled by mineral matter brought up from the interior of the earth,—

Q. And as to a placer?

A. —into its present position or envelope, which already existed before it came there, and is consequently a mineral matter, a stranger to its enclosing formation. As to a placer, I consider a deposit that is produced by surface precipitation, in cold water, by mechanical concentration of the action and motion of water and other forces, and afterwards became valuable as a whole or for its contents, regardless of whether it is solidified or not.

Q. Do you know in your experience of any lode or vein which is mined for the mineral contained within the fissure as a whole; or is it necessary to resort to a process of extraction?

A. Lode deposits are usually any combination of ore and gangue, which has to be mined together, and subsequently separated by milling or smelting to extract the metallic contents for which the operation is generally carried on.

Q. In your experience as a practical miner and

(Testimony of Robert N. Bell.)

prospector, mine valuer, and inspector of mines, do you call this phosphate deposit a vein or lode?

A. No; I should not call it either.

Q. Would you call it a vein at all, Mr. Bell?

A. No. I should call it a bed.

Q. You say it has a strike? A. It has.

Q. And a dip? A. Yes. [829]

Q. And is it rock in place, Mr. Bell?

A. Yes.

Q. How would this material be mined, to mine it in the most economical manner?

A. Why, the most economical manner of mining it would be to mine the ore that has a thin layer of covering on them, by stripping and quarrying it, and subsequently by cross-cut tunneling, and driving entries along the strike of the bed, and working it on the long wall method of coal mining, just like you would work a coal deposit. It is a similar proposition.

Q. In your opinion, Mr. Bell, as a practical miner, would the ordinary prospector take this deposit, from its physical appearance, to be a lode or vein?

A. The definite evidence already submitted is that the ordinary prospector would take it for a coal vein, and actually did take it for a coal vein, and endeavored to develop it as such. Not only that, I am advised that—in fact, I know other prospectors in the Teton country who have located the same horizon as a coal vein, mistaking it for a coal vein; and I am informed that the original Hayden Survey that went through that country marked areas of coal which

(Testimony of Robert N. Bell.)

have since then been recognized as the same phosphate horizon.

Q. Coal, Mr. Bell, is a bed, is it not?

A. Yes; it is a sedimentary deposit, an accumulation of vegetable matter on the surface of the earth, subsequently covered.

Q. And it differs from a vein as you have described it?

A. It differs from a vein or lode of metallic mineral, decidedly. [830]

Q. There are places, then, Mr. Bell, as I understand you, where this deposit would be mined by a quarry method? A. Yes, sir.

Q. And that would be the only practical method?

A. That would be the only practicable method of mining those shale areas between these draws where there is not much cover on it.

Q. Are you familiar with deposits of building stone, limestone, gypsum, cement, and so on?

A. Yes, sir.

Q. In what places?

A. Well, we have some very excellent building stone quarries at Boise. The state owns one, and there are several private individuals own them, that is quite extensively used for building purposes, a rather flat, tipping bed of coarse sandstone; and there are a number of small quarries of volcanic tuff used for building stone. Along the border of the upper Snake River Valley, in the Horseshoe Basin in the Teton country, we have some excellent deposits of cement-making material, including quite pure limestone, and

(Testimony of Robert N. Bell.)

pure shale. The same thing occurs in Bonner County, on the Lake Pen d'Oreille, where it is being mined and used for cement and lime manufacture.

Q. Have you seen all these deposits?

A. Yes, sir.

Q. How do they compare with this deposit of phosphate rock, as to their dip and strike?

A. Why, the sandstone deposits at Boise are flatter; the cement and lime deposits at Lake Pen d'Oreille stand at an [831] angle, as I remember, all the way from  $45^{\circ}$  to  $60^{\circ}$ ; and these limestone deposits in coal veins at Teton Basin stand at an angle of  $45^{\circ}$ . In other respects the bedded structure is generally similar to the phosphate series.

Q. Have they a bed and roof of solid rock formation?

A. The different layers of limestone have; the one layer will form the roof of another, and the one below it will be the floor of that immediate layer.

Q. Well, are the upper—are the covering or cap lime and the basal lime of different quality and structure?

A. In the coal deposit of Teton Basin that is true; the underlying lime is rather silicious, with a good many segregated lines of silica in it; and the overlying formation is shale.

Q. The overlying formation, you say, is shale?

A. Over the good bed—the silicious bed, then a bed of pure lime about 50 feet thick, then a bed of shale of say 25 feet thick.

Q. And these beds are in place in the mountain?

(Testimony of Robert N. Bell.)

A. Yes, as much in place as they are in the property in question; they have been folded in a similar manner, only a little more intensely.

Q. How extensive are these beds of limestone?

A. Oh, they extend—they are exposed in sight for about a mile, along the face of the cliff.

Q. For what purpose are they mined?

A. They are not mined at present.

Q. They are not mined? [832]

A. No. The coal is mined below them, and it is sold for the purpose of fuel to the farmers around there.

Q. Calling your attention to these cement deposits, are they mined now? A. Yes, sir.

Q. And what is the stratification that is in evidence where these beds are exposed?

A. Why, the stratification there is a wide series of lime beds probably—I haven't got the exact dimensions, but I should say a mile wide, of pretty pure gray lime, overlaid by a series of shales and slates a mile wide, in conformable order, and underlaid by a series of quartzites, the whole forming the upper horizon of the belt series of sediments.

Q. Of a sedimentary nature?

A. Yes, metamorphosed sediment; they have been somewhat altered.

Q. Have they a dip and strike? A. Yes.

Q. And what is the dip?

A. It varies up to as high as 60°.

Q. And are the boundary lines or planes between these several beds well defined, or otherwise?



(Testimony of Robert N. Bell.)

A. Between the formations I have mentioned they are well defined—between the shale and the lime, and the lime and the quartzite.

Q. Let me understand you; how deep did you say this shale was, Mr. Bell?

A. Oh, the series of shale is probably a mile thick.  
[833]

Q. A mile thick?      A. Yes.

Q. And the lime?

A. Of similar thickness; and the underlying quartzite series, which varies in texture from pure quartzite to shaly quartzite, varies in textures of quartzite. That is 30,000 feet thick, known as the Coeur d'Alene series.

Q. Have any other deposits of a similar nature came under your observation?

A. Yes. There is a bed of gypsum in Idaho, about six miles below the Huntington bridge on the Oregon Short Line, on the Idaho side of the Snake River, about ten feet wide, with a roof and floor of blue slate.

Q. And how wide—how thick are these layers forming the roof and floor?

A. The upper layer above the gypsum bed I think is probably 50 feet, and the one below exposed for 25 to 50 feet. The exposures are not regular; they are covered more or less with debris, and it is not easy to determine.

Q. Is the line of demarcation between these several beds well defined, between the gypsum and the floor and the roof?

(Testimony of Robert N. Bell.)

A. Yes; the roof and floor both are well marked, and quite smooth.

Q. And has this gypsum bed a dip and a strike?

A. Yes, sir.

Q. What is the dip?

A. I am not sure. I think the dip is about 40°, and the strike northwest and southeast. [834]

Q. Are you familiar with the manner of locating different classes and characters of deposits?

A. Yes.

Q. How are gypsum beds and building stone deposits located?

Judge DEY.—Oh, I object. There is a special law for building stone.

A. They are located as placers, and properly patented as such.

Q. And that is true of both of them, is it?

A. Yes.

Q. Do you know of any sedimentary deposit in Idaho, lying within well-defined walls of rock, that is located as placer? A. Yes.

Q. Where is it?

A. Well, on Bear River we have some conglomerate gold-bearing gravel beds that rest on a granite bedrock, and have a roof of black basalt lava. It is a sedimentary bed in that sense.

Q. What is the overlying rock? A. Basalt.

Q. Basalt? A. Yes, sir.

Q. Is that a deposit on—black deposit, also, on Moore's Creek?

A. Yes, there is a similar deposit on Moore's

(Testimony of Robert N. Bell.)

Creek, and on Bear River, a capping of basalt 20 feet to 50 feet thick, and the one on Moore's Creek as much as 100 feet thick. They have been cut through by subsequent erosion, and the bed of gravel [835] exposed under it, and it has since been mined by tunneling.

Q. From your experience as a practical miner, Mr. Bell, how would you consider the phosphate rock in question should be located?

A. By reason of the unquestionable evidence of its sedimentary nature, practically unaltered since it was formed, I should consider that it ought to be properly located as a placer; and for the further reason that it is a nonmetallic mineral; simply a consolidated natural manure, and its chief use in commerce would be for that purpose, for fertilizing land.

Q. What do these fossils indicate to you as a practical miner, as to the method of deposition?

A. They indicate that the material was deposited on the floor of a shallow sea. They are apparently marine fossils; they have been classified as such, and show very clear and distinct forms, which have remained unaltered since they were deposited there.

Q. And what have you to say as to whether these fossils are abundant or otherwise?

A. They are extremely abundant in the narrow bed of cap lime overlying the five-foot bed of phosphate, so much so that it is readily identified, at every opening where the bed has been cut, from one end of the property to the other, as far as I examined it, and its identity is readily recognized; which is also

(Testimony of Robert N. Bell.)

true of the fossil impression of the cherty overlying limestone beds that cover the phosphate series; they are characterized by another type of fossils of larger form, which seem to be persistent as far as that bed is exposed. [836]

Q. Did you examine at any time the claims shown on Plaintiffs' Exhibits "A" and "B," commonly known as the Wyoming claims, in Raymond Canyon?

A. No, sir; I have never been over them.

Q. You have never been over them?

A. No, sir.

Cross-examination.

(By Mr. JACK.)

Q. Where are these fossils found which you speak of—in what part of the series?

A. In the cap lime, immediately covering the five-foot phosphate bed.

Q. Do you find them in the bed of phosphate itself?

A. They show impressions where they stick out of the cap lime into the phosphate material.

Q. Where the fossils were upon the top of the underlying stratum, or on the under side of the upper stratum—

A. —they left slight impressions into the phosphate material of the bed.

Q. You say this is a valuable mineral substance—this deposit? A. For—

Q. For some purposes?

A. For some purpose, yes—non-metallic purposes.

Q. The phosphate in the material is what renders it valuable for its fertilizing qualities?

(Testimony of Robert N. Bell.)

A. The combination of the phosphate and the calcium carbonate. [837]

Q. Yes; but the phosphate added to the carbonate is what gives it its value? A. Yes.

Q. Did these fossils or the animal and marine life that was probably in the water at the time the stratum was formed, have anything to do with the source of the phosphatic material in this bed, do you think?

A. It is very probable that they had. That could be one possible source of the origin of the phosphate material.

Q. That is, as the lime was being laid down, your idea is that it was covered with water, and it was laid down in the shallow ocean? A. Yes.

Q. And in this water were probably marine life—marine animals? A. Yes.

Q. Or vegetable matter, and they contained fossils— A. —phosphates, in their strict—

Q. —and being decomposed would release the phosphate, so that it united with the—

A. —precipitated with the lime carbonate.

Q. And precipitated on the bottom of the ocean?

A. Yes, sir. That is one possible source.

Q. That would seem like a reasonable explanation of it—a constant leaching of the phosphate from the marine life, mingled with—

A. Not a leaching—a rotting of the bodies of the animals. [838]

Q. Yes, that released that phosphate?

A. Released the phosphoric acid.



(Testimony of Robert N. Bell.)

Q. And it settled down upon the lime under it, on the bottom of the water, wherever it was deposited?

A. Yes. On the other hand, those marine animals may have formed food for birds, that accumulated extensive layers of guano on the shores of that ocean bottom, which subsequently was dissolved and transferred into the ocean water by surface streams, and then precipitated into the lime forming sludge at the bottom.

Q. Then, that released phosphoric acid from this life, united with the calcium that was on the bottom of the ocean? A. Or in the water.

Q. Or in the water, and formed the calcium phosphate? A. Yes, that is one, probably—

Q. And that is the ingredient substance as we have it in this deposit now?

A. Yes, sir; that is one probable form of its origin.

Q. Will you give me your definition of placer again?

A. I consider a placer an accumulation of sedimentary material on the surface of the earth, brought about by action of—mechanical action of cold surface water, and at the present time may be loose or solid, but valuable for commercial uses or the metallic contents which it may contain.

Q. And the substance carried from its original position and deposited on some other portion of the earth's surface?

A. Yes; that would be part of my definition—an accumulation of material from some other source, by surface action, or marine action. [839]

(Testimony of Robert N. Bell.)

Q. You have spoken about building stone, gypsum, and sandstones; are they placers?

A. Yes, sir; they are properly located as placers, according to my understanding of the law.

Q. And do they come under your definition of a placer?

A. They come as coal on the surface of the earth, or on the bottom of the sea.

Q. Then, is every sedimentary rock a placer?

A. If it had a commercial value as such it could be located as a placer. Any other sediment would be as eligible for location as a placer as limestone is.

Q. You have made a great many locations during your experience as a miner?

A. Yes, I have, in a good many years.

Q. Did you make any ledge locations?

A. Yes, sir.

Q. What determined you as to the character of the location that you would make?

A. Whether I would make it as a lode or a placer?

Q. Yes?

A. Well, in my early experience Copp's Handbook usually determined me. If it described—if it contained metallic mineral I would locate it as a lode. If it had the other necessary requirements, and if it was loose material, or if it was a gem deposit, either loose or in the form of a dike or fissure vein, I would have located it as a placer.

Q. What location did you ever make—ledge location?

A. I located an igneous dike of rhyolite, with

(Testimony of Robert N. Bell.)

walls of andecite and breccia, containing gem opals; and there is a [840] specimen out of the property, if you care to look at it. (Handing same to Mr. Jack.) I have located copper mines and gold mines.

Q. Where did you make copper mine locations?

A. I made the original location in the Blackbird Copper District, which was afterwards quite extensively developed by John E. Dubois.

Q. Where did you make the gold ledge location?

A. Oh, in half a dozen places; one in the Leesburg Mining District known as the Haidee.

Q. Was that free gold? A. Yes, at the surface.

Q. Was the gold clearly discernible in it, when you first discovered it, at the surface?

A. Well, yes, it was. By careful selection I could find little cubes of hematite, showing specks of gold.

Q. And you found that before you made your location?

A. Yes; I found the vein before I made the location.

Q. You found specks of free gold in the rock before you made your location? A. Yes.

Q. In the copper location that you made, was the copper clearly discernible in the first specimens you found? A. The copper oxide mineral was, yes.

Q. You could tell from the looks of it—

A. Yes.

Q. —what mineral it contained? A. Yes. [841]

Q. Did you ever locate any rock in which the mineral you were seeking was not clearly discern-

(Testimony of Robert N. Bell.)

ible—that you didn't know what it contained?

A. Well, no; I can't say I have located rock that contained mineral that I did not suspect, but it always had some mineral in that I recognized. For instance, in the Blackbird District discovery I located that property as copper ore, and it subsequently proved to contain both nickel and cobalt, but I had had no previous experience with those minerals up to that time, and didn't recognize—

Q. Suppose the copper had not shown in there; how would you have determined what class of location to make?

A. By the form in which it occurred.

Q. You mean the position it occupied in the earth?

A. In the earth, yes, together with the condition of its walls, or envelope containing the formation.

Q. Taking this cobalt ore which you could not determine by looking at the specimen, how would you know whether to make a ledge or placer location?

A. Because it had copper minerals in it that were very readily recognized.

Q. I say, without the copper mineral so that you could detect it?

A. Well, then, without the copper or cobalt or nickel, it had certain forms of crystals—

Q. I am not referring to that particular one. Suppose you had the ore in which the mineral cobalt and other minerals were not readily determined by visual inspection of the specimen, what would you

(Testimony of Robert N. Bell.)

have to guide you as to what kind of a location [842] to make?

A. The condition of the country rock. Most lode or vein deposits have influenced the country rock in a way that has changed its appearance. The solutions that have come in to form that lode deposit have leached the country rock, as a general thing, close to the walls, and changed its texture or color.

Q. Then, you would go by the position it occupied in the surrounding country and the appearance of the rock? A. The enclosing formations, yes.

Q. And if it turned out that the valuable mineral therein contained did not come from subterranean waters, your location would be invalid?

A. Not necessarily.

Q. Didn't you say a ledge must be filled from subterranean sources? A. I said originally.

Q. Originally? A. Yes, sir.

Q. And if it turned out that it was not originally filled from subterranean waters, would your location be invalid?

A. It could not be filled in any other way.

Q. Couldn't it come down from above by concentration leaching it from surrounding rocks?

A. Well, it would have to come up first, if it was lode mineral.

Q. Not necessarily in this fissure?

A. This particular fissure? No, but in some other [843] fissure, and the influence would be shown on this fissure, and this fissure would be there to receive it.



(Testimony of Robert N. Bell.)

Q. In other words, before you could make a ledge location you must know the source of the filling matter, must you?

A. Well, you must have a pretty good idea of it. You can tell whether it is the lode source or placer source, for the reason that the lode material is almost invariably metallic or crystalline in some form, and the sedimentary is unaltered, very seldom crystalline.

Q. How about the placer deposit you speak of up on the Boise River; isn't that a metallic substance?

A. The gold is metallic that is in it.

Q. And that is the substance that the miner is after, isn't it?     A. Yes, sir.

Q. And that is what he makes his location on?

A. Yes, as a placer.

Q. Then, how does the metallic contents affect the ledge or the placer location, determining that?

A. Well, if you found a deposit that was useful for something other than the extraction of metal, and of sedimentary origin, that would determine its nature, that it was not a ledge, I should think, from the general construction of such matters.

Q. As a matter of fact, Mr. Bell, doesn't every miner determine upon the nature of his location from the occurrence, the position it occupies in the earth, and the nature of the rocks surrounding it?

A. No. If the miner—if he knew that this was manure [844] he would not locate it as a ledge, I don't think.

Q. Suppose he didn't know it was a manure?

(Testimony of Robert N. Bell.)

A. If he didn't know it was a manure he wouldn't know that it would have any value at all, because it doesn't show that it has any evidence of metal.

Q. The first locations of this deposit was made how? A. As placer, I believe.

Q. And when they took them as coal—when they supposed they were coal? A. As coal, yes.

Q. Did that make a placer deposit, to take it as coal?

A. Well, they took a claim equivalent to placer, a deposit or claim with definite boundary lines, vertical lines, all around.

Q. What do you mean—the equivalent of a placer deposit or placer location? A. Sir?

Q. What do you mean by equivalent to placer location? Is there any equivalent for a placer location?

A. Well, when I say “equivalent,” I mean the recent decisions have made deposits of natural gas and oil several thousand feet deep in the solid strata of the earth locateable as placers.

Q. What decision?

A. I haven't any definite references, but I think Mr. Budge can furnish you—

Mr. BUDGE.—Well, that is the law, I think.

A. —some law on that subject.

Mr. BUDGE.—That is the oil law of 1897.

A. And the same ruling or law has been passed in regard [845] to locating sedimentary deposits such as limestone, gypsum, salt, etc., as placers.

Mr. JACK.—Q. Yes, that's right Mr. Bell.

(Testimony of Robert N. Bell.)

Then, this building stone and coal and oil are located under special statutes upon those subjects, are they not?

A. I am not sure about that. I think, according to my memory of the placer law of twenty years ago, there were several substances besides metal-bearing rock, the nonmetal-bearing minerals that were located as placers, as I have stated, the gem deposits, whether consolidated or otherwise.

Q. Do you in making your mining locations go by the law or by geology?

A. Oh, I go by both. I would confine myself to the law, and take advantage of the best kind of law that was offered, that fit the deposit to the best advantage.

Q. Do you know what the provisions of the law are for making a ledge location?

A. Yes. It is first necessary to find a vein or lode; then you are permitted to—

Q. —of what?

A. Of quartz, or other rock in place, containing a number of designated metals.

Q. Is this rock in place? A. Yes.

Q. Containing minerals of value?

A. Mineral, but not metals.

Q. I say mineral of value? A. Yes. [846]

Q. I believe in your definition of a lode or placer you laid some stress on the use to which it is to be applied. Did you not make that one of the conditions?

A. Yes, I think probably I did.

(Testimony of Robert N. Bell.)

Q. If it were used for fertilizing purposes it must be located as a placer?

A. In view of the fact that that is a commercial purpose, like using limestone for refining sugar, I should think so.

Q. That is one of the determining factors, as to whether it should be lode or placer?

A. And the fact that it is nonmetallic.

Q. Then, your idea is that the substance for which the deposit is valuable must be metallic in character? A. To be located as a—

Q. To be located as a lode or vein?

A. That was my general conception.

Q. Is that your opinion now?

A. My opinion now is still the same, though I understand one exception has been made, to the location of Gilsonite in lode form.

Q. Of what?

A. A gilsonite deposit in a fissure vein.

Q. With the exception of Gilsonite, all other deposits must be metallic in nature?

A. Must contain metallic minerals, to be properly locateable as lodes. excepting the placer deposits of loose detrital material.

Q. You except those under a special statute?

A. Well, excepting the detrital deposits of material. [847]

Q. Well, what characteristic of a vein do these deposits lack, except the metallic character of the contents?

A. Why, the principal characteristics that they

(Testimony of Robert N. Bell.)

lack is a decided absence of a selvage separating the valuable mineral from the wall rock, together with the unaltered condition of the wall rocks, which remain practically as they were consolidated when they were laid down. If it were a vein or a lode those conditions would not be manifested in their original form; they would be altered by the action of acid solutions leading the rock, replacing it with silica, or dissolving it out and replacing it with something else, some other form of mineral, and there would be an altered condition of the primary sedimentation. But where it has those primary conditions—the unaltered fossils are still there the way they were laid down; the fossil rock, apparently, from its oolitic structure, shows the concentric wave action, of motion, of rubbing together of the grains, and the underlying basal limestone, where exposed at the surface, shows weathered outlines of fossil shells. I don't know of any lode or vein deposit that shows those unaltered conditions.

Q. The rocks below and above this deposit are clear and distinct from the phosphate beds, are they not?      A. Yes, sir.

Q. And your idea is that these wall rocks must be altered in character, especially close or next to the deposit, in order to constitute a vein?

A. They almost invariably are, in a lode or vein deposit.

Q. Is it necessary that they should be?

A. It is to my mind necessary that they should be changed [848] from the original sedimenta-



(Testimony of Robert N. Bell.)

tion forming the walls or veins.

Q. You have visited Park City, you say?

A. Yes, sir.

Q. Are there sedimentary rocks there?

A. Yes, sir.

Q. Are the rocks below and above, or enclosing the ore deposits there, changed from their original form?

A. The rocks enclosing the ore bodies in contact with the ore are decidedly changed.

Q. What is the character of the rocks enclosing the main deposits there in Park City?

A. Limestone, quartzite, porphyry.

Q. In what manner is the quartzite changed?

A. It is hardened into a glassy surface, and being abraded, in some places an accumulation of talc has formed on it.

Q. For what distance from the ore body?

A. Varying distances; in some places there is a fault breccia selvage a foot in thickness, but generally narrow.

Q. Then, anything less than a foot is sufficient change?

A. Oh, yes; a fraction of an inch would be sufficient if it were the proper material. The limestones in the Daly-West are decidedly changed. The main bonanza bed at the 900 foot level showed two layers of rich sulphide of lead and zinc ore, with a thin bed of limestone in between, that had been almost completely digested into a white chalky substance, in parts of one of the main bonanza stopes I examined.

Q. If you find a deposit—

(Testimony of Robert N. Bell.)

A. Gypsum is found in true veins, and has beds.

Q. If you found a deposit of which you wished to make a [849] ledge or vein location, you attempt to locate the length of your claim with the strike of the vein, do you not?

A. Yes sir; that gives the—

Q. How do you get at the strike of the vein?

A. I find out the dip, and then take the opposite direction.

Q. You would not go by the outcrop?

A. I would go by several points of outcrop, if I could find them and found that they were conformable in one direction.

Q. But you would find the dip first?

A. Oh, it would depend on conditions altogether. I would try and find the strike, though.

Q. Which would you find first, the strike or the dip?

A. Well, the chances are I would find the strike first.

Q. And then attempt to locate your claim?

A. And then find out whether I had a vein or not; and then I would find out what my dip was; and from that I would get my strike true.

Q. What would determine the strike in making your location?

A. Why, uncovering the apex or outcrop of the vein, usually.

Q. And you would follow that as nearly as you could?     A. Yes.

(Testimony of Robert N. Bell.)

Q. That is the way locations are always made, are they not?

A. Well, if the thing was already shown as this was, where the strike and dip was extensively exposed by workings, [850] there was no reason to locate yourself as you did there, I don't think.

Q. Is it your idea that these locations were made after the work was performed?

A. After a good deal of it was performed, yes, sir.

Q. How did you get that idea?

A. I got it from talking with Mr. Taylor, that the work—we examined a good deal of it—was done when these claims were made.

Q. He told you that the work was done before the locations were made?

A. Yes, before the lode locations were made.

Mr. JACK.—Just read the question I have asked first for him to answer.

(The Special Examiner repeated as follows:)

“Q. If you found a deposit which you wished to make a ledge or vein location, you attempt to locate the length of your claim with the strike of the vein, do you not?

“A. Yes, sir; that gives the—

“Q. How do you get at the strike of the vein?

“I find out the dip, and then take the opposite direction.

“Q. You would not go by the outcrop?

“A. I would go by several points of outcrop, if I could find them and found that they were conformable in one direction.

(Testimony of Robert N. Bell.)

“Q. But you would find the dip first? [851]

“A. Oh, it would depend on conditions altogether. I would try and find the strike, though.

“Q. Which would you find first, the strike or the dip?

“A. Well, the chances are that I would find the strike first.

“Q. And then attempt to locate your claim?

“A. And then find out whether I had a vein or not; and then I would find out what my dip was; and from that I would get my strike true.

“Q. What would determine the strike in making your location?

“A. Why, uncovering the apex or outcrop of the vein, usually.”

A. Is that your question?

Q. Yes.

A. Well, what would determine the strike would be considerable work on the original discovery.

Q. But it would be made from the outcrop, would it not? It would be determined from the outcrop?

A. No, not with my present knowledge of the conflicts that are derived from extralateral troubles. It generally would not be determined from the outcrop—from the direction of the outcrop.

Mr. JACK.—Will you just repeat that answer?

(The Examiner repeated the last answer.)

Q. Generally it would not be? [852]

A. Not from the local direction of the outcrop, no.

Q. What would you determine it from?

A. I would take the dip into consideration, too.

(Testimony of Robert N. Bell.)

As a matter of fact the strike could not be obtained without taking the dip into consideration at several points on that group.

Q. On this group? A. No.

Q. I am speaking generally.

A. If you was out prospecting?

Q. Yes.

A. Well, as I say, I would have to cast around the discovery, as a Cornishman would say, and find out what the direction was, and what the dip was.

Q. As nearly as you could?

A. As nearly as I could, and lay the side lines and the end lines.

Q. And lay the side lines and end lines of your claim accordingly?

A. Accordingly; and if I couldn't get a full claim without running the apex of the vein through the end lines, I would take a short claim, so as to be sure that I had the extralateral rights of what I did take.

Q. The claims which you have examined, and which are shown upon Plaintiffs' Exhibit 1 and Defendant's Exhibit 2, have considerable work done inside of the lines of the lode locations, have they not?

A. Yes, sir.

Q. Do they show the mineral through there?

A. Yes, sir. [853]

Q. The black line that you examined, that is shown upon Defendant's Exhibit 2, approximates the foot-wall of the phosphate series?

A. Yes—of the five-foot bed.

Q. The dip is to the west and into the mountain, is it not?



(Testimony of Robert N. Bell.)

A. The dip is to the west and out of the mountain, from the Montpelier Canyon south.

Q. From the Montpelier—

Mr. BUDGE.—It comes down this way, and then jumps and dips in there.

A. The mountain is an anticline, with a slope to the west. The anticline thickens up going north from the mountain ridge, which constitutes the crest of the anticline—

Q. Did you say north of Montpelier Canyon, that it dips out of the mountain?

A. I say south of Montpelier Canyon.

Q. I was asking about the other claims north of Montpelier Canyon.

A. Oh, I thought you were asking about the whole exhibit.

Q. No.

A. I beg your pardon. North of Montpelier Canyon the—

Q. Just whether it is into the mountain or not.

A. Well, it dips out of the mountain on the north side of Montpelier Canyon, of the range as a whole. It dips into the side of Gertch Hollow, into the east slope of Gertch Hollow. It practically dips into the body of the west leg of the anticline. [854]

Q. Let me see if I understand you: Is the ground higher or lower to the west and north of the Montpelier Canyon?

A. Immediately west it is higher, but it is higher still to the east, so that you haven't got the crest there, you have only got a part of the mountain slope; but

(Testimony of Robert N. Bell.)

there is a hollow running down there which makes the bed, as you see, dip apparently into the mountain, but as a matter of fact it is dipping into the valley also.

Q. And south of Montpelier Canyon, at the Hickman lode, is the dip into the mountain or out of the mountain?

A. It is out of the mountain, according to the slope of the mountain, into the valley.

Q. Now, take the Arkansas lode: Do I understand you the black line shows the outcrop of the deposit?

A. Approximately.

Q. And the black line throughout the Mount Pleasant claim is the lower edge of that same deposit?

A. Yes, sir, where it has been cut out by Montpelier Canyon.

Q. So that the Arkansas lode apexes the Mount Pleasant?

A. Yes, that's it, exactly; it apexes all the mineral that is on the Mount Pleasant, unquestionably.

Q. What is the effect if a ledge location is not exactly with the strike of the vein?

A. Well, in several cases there it would lose considerable of its length.

Q. I mean in general. It would lose what?

A. Considerable of its length, wherever the deposit on the side line or end line would have to be drawn into that point. [855]

Q. And when you state that the placer claim, as I understood you, would steal a good part of the apex of the Obed lode, you mean simply that the vein runs

(Testimony of Robert N. Bell.)

out of the side line of the Obed claim; is that it?

A. No, I didn't say that. I said that if the lode location were made on this Wilmington placer it would steal a third of the apex of the Obed lode; but it doesn't cover the highest apex of the deposit.

Q. The workings that you spoke of that you examined are upon the Waterloo placer patented claim, are they not? A. Yes, sir, I believe so.

Q. There are no extensive workings on the others that you found?

A. Not very extensive. There were a number of short tunnels and open cuts and strippings.

Q. What is the deepest point on the strike of any of these deposits that you are familiar with?

A. The deepest point?

Q. The greatest depth on the dip, I mean.

A. Well, I consider the greatest depth on the dip of the deposit there outlined to be the southwest end of the Overton lode—not the southwest end, but down in there where those first cuts occur.

Q. Well, just give the distance, about, as nearly as you can estimate.

A. Well, from there to the highest point on the Wilmington placer on which the deposit is exposed, would be, at a guess—I didn't measure it—800 feet, and I think the dip is exposed [856] to that extent, for the reason that you can stand on the rim of Montpelier Canyon and see the—

Mr. BUDGE.—At what point, Mr. Bell?

A. About 100 feet from the northeast corner of the Mount Pleasant lode, on a bluff of the hard basal

(Testimony of Robert N. Bell.)

limestone, 200 or 300 feet above the creek-bed; and you can see the strike and dip of the deposit for a mile; you can see the strike, I should say, very distinctly, by the bold outcrop of the underlying limestone cliffs and the discoloration of the ground, and the development—the openings along the five-foot bed.

Mr. JACK.—Q. If the mineral contents of this deposit were lead, would this be a vein or lode?

A. The chances are it would; because the condition under which that lead would occur would be different from the condition under which this phosphate occurred.

Q. I am asking if the strike, dip, walls, and position in the mass of the mountain were exactly as they are now, and the valuable contents of the rock of this deposit were lead, should this be located as a vein or lode?

A. It is a physical impossibility for lead to occur without changing the condition of those walls.

Q. Without changing what?

A. The condition of the walls.

Q. You mean as to the effect upon it?

A. As to their present unaltered sedimentary appearance.

Q. But if the walls were changed to the distance of three inches on each side, would that make it a ledge or vein? [857]

A. It would be evidence that there was a fissure source for the metallic mineral solutions that had run into that bed or vein, like it does in Park City in

(Testimony of Robert N. Bell.)

places; and it would be properly locateable as a lode if those altered conditions were there.

Q. And if they were not there?

A. If they were not there the ledge or mineral would not be there, either.

Q. But if they were there and the walls were not?

A. It could not be there unless the walls were altered.

Q. Then, you refuse to alter that, Mr. Bell?

A. I refuse to admit that a lode mineral can be found in an unaltered sedimentary condition of that kind; that it had been washed in from the surface in placer form into a crevice.

Q. But if it were so—if such a thing should occur—would you locate it as a ledge or vein?

A. Such a thing could not occur, so I could not locate it as a ledge or vein.

Q. Do you know all the occurrences in nature?

A. I do not; but from the number I do know and the number I have read about in the different parts of the world, I do not believe that any lode mineral occurs without an accompanying alteration of its enclosing formation.

Q. You don't believe?

A. I never read of any.

Q. Do you know if it can be so?

A. I don't believe it can be so.

Q. I know you don't believe—you say you don't believe—but do you know it?

A. Well, I know it as much as I know that you have got a [858] heart in your body without seeing it.



(Testimony of Robert N. Bell.)

Q. That is the only way you know it? Are you familiar with the deposits down at Silver Reef, in Utah?

A. I have never been there. I have read about them.

Q. Isn't that in a sedimentary deposit?

A. A sedimentary deposit, accompanied by irruptive rocks, or fissures in the sedimentaries.

Q. Are there any instances of any kind in mines where metallic substances are in sedimentary rock?

A. Yes, lots of them. There is not a camp in Utah where the metallic substances are not more or less in sedimentary series.

Q. Then, why do you say that if this deposit were lead, or gold, or silver, between sedimentary walls, it would not be a vein or lode? A. I don't say so.

Q. Would it be?

A. It would be if the walls were altered by the introduction of those minerals.

Q. Yes, it would be if the walls were altered?

A. Yes.

Q. In other words, occupying the same position in the mass of the mountains as this does, and the substance of value were metallic, it would be a ledge or vein?

A. And the other conditions accompanying a ledge or vein were there, yes.

Q. By "other conditions" do you mean in the alteration of the wall rocks?

A. The wall rocks, yes. [859]

Q. If this were a fissure, in sedimentary rock, and

(Testimony of Robert N. Bell.)

filled with this phosphorite, or tricalcic phosphate, would it be a ledge or vein?

A. It would be a vein, but locateable as a placer.

Q. Locateable as a placer?

A. Yes, under my understanding of the matter.

Q. That is on account of—

Mr. BUDGE.—Just a minute. I would like you to understand that last question, please.

(The last question was repeated, as follows:)

“Q. If this were a fissure, in sedimentary rock, and filled with this phosphorite, or tricalcic phosphate, would it be a ledge or vein?”

Mr. JACK.—Q. On account of its nonmetallic character?

A. Being a nonmetallic mineral, and of comparatively low commercial value, like coal and other substances that can't stand the high expense of treatment.

Q. Then a nonmetallic substance, no matter what its treatment in the surrounding rocks or the mass of the mountains, is locateable as placer and not as vein?

A. No. You will have to except coal, and as I said, that one instance of Gilsonite.

Q. Well, that, as I understand you, is on account of special statutes on the subject?

A. I think so. As a general proposition, the placer application is given to mineral products of low commercial value.

Q. Gilsonite is not under special statute; but you are making an exception of that substance? [860]

(Testimony of Robert N. Bell.)

A. I think there was a decision that by reason of its unusual occurrence in the fissure it was allowed as a lode claim. But if that Gilsonite had been found as a bed, lying horizontally on the surface, covered or otherwise, it would properly have been locateable as a placer, and I think is located as a placer.

Q. In your examination of the workings upon the Waterloo patented placer, you spoke of encountering niggerheads? A. An occasional niggerhead, yes.

Q. By that you meant a bunch of country rock, or foreign rock?

A. No. It is a concretion of foreign material like. It is a common occurrence in a coal vein.

Q. Not valuable material?

A. It is not valuable, and not very common. It was only a rare occurrence.

Q. And in mining this substance and marketing it, you just throw this to one side as waste material?

A. Yes. The total accumulation of what they had thrown outside, out of that 5,000 tons mined, I don't believe would exceed five tons; so it was a negligible quantity. The bed was almost pure.

Q. In determining the outcrop of the phosphatic series, and which is indicated by the black line upon the Defendant's Exhibit 2, did you walk over that outcrop the entire distance covered by those claims?

A. The entire distance from the Waterloo placer north, throughout its meanderings, to the point marked "B" on the Wilmington placer. [861]

Q. Well, that is practically the entire distance, is it not?

(Testimony of Robert N. Bell.)

A. Practically it is the entire distance, with the exception of the three or four lode claims on the south end.

Q. Was that outcrop clear and defined, so that you could see it all the way along?

A. The outcrop was not clear and defined so that you could see it every inch of the way along; but we could follow the outcrop with short exceptions by the color of the ground where it was not exposed by cuts, or where we could not follow it from one cut to the other.

Q. Can you point us any place along this dark line where there were these few intervals of unexposed outcrop? A. Yes. There is one. (Indicating.)

Q. Well, just take a lead pencil and mark a couple of marks at those various points.

A. There was a point there. (Indicating.)

Q. Take the lead end.

(The witness marked the place indicated.)

Q. Now, you have marked with lead pencil the only points where the outcrop is not clearly in evidence.

A. No. I don't say the outcrop is clearly in evidence; but the evidence of the outcrop—the apex is defined by the discoloration of the phosphate rock giving it a brown color.

Q. Are there not hundreds of feet in places where the series is so covered with wash that the outcrop is not clearly traceable?

A. There are, with the exception that they have been cut [862] through by development cuts that have exposed it.

(Testimony of Robert N. Bell.)

Q. In all of these places? A. Yes, sir.

Q. And cut out to the highest rim of the series?

A. Yes, sir.

Q. At the point near post 1 of the Arkansas lode there is indicated a gully or depression?

A. Yes, sir.

Q. The black line runs right across to the north—north and south—across this gulch. Does that gulch cut the phosphate bed? A. Yes, sir.

Q. But the outcrop shows entirely across that gulch?

A. No; it is covered with the bottom of the gulch.

Q. So that where this line—the dark line—crosses the little gulch, it is not in evidence?

A. I don't believe it is at that particular point for a few feet. The gulch is very narrow there.

At this time a recess or adjournment was taken until to-morrow morning at 9:30 o'clock. [863]

On Saturday, the 24th day of June, 1911, at 9:30 o'clock A. M., the hearing was resumed, pursuant to adjournment.

ROBERT N. BELL, a witness heretofore called by the defendant, and duly sworn, being recalled for further cross-examination, testified as follows, to wit:

Cross-examination (Continued).

(By Mr. JACK.)

Q. Mr. Bell, I was asking you as to the direction in which the vein dips. You said it dipped west, and I asked you if the plane dipped into the mountain. What was your answer in regard to that?

A. My answer was that it dipped out of the moun-



(Testimony of Robert N. Bell.)

tain, towards the valley.

Q. How far would it extend on its dip before it run clear out of the surface that was dipping into the mountain?

A. Well, you rather misunderstand my meaning. I don't believe that it would ever come to the surface, but it would still dip out from the axis of the mountain towards the valley, but probably pass under the valley at a relative distance from the surface that it has from the slope of the anticline which the mountain is formed of. [864]

Q. That is, it more or less conforms to the slope of the mountain?

A. In its southern half, yes; although there is one point on the Overton lode, I think,—yes, on the Overton lode,—where the bed is exposed at its lowest point where the dip seems to flatten, as if the whole series was flattening, and would consequently be brought a good deal nearer the surface when it reached under the valley than it is to the surface of the anticline, as exhibited by the slope of the mountain.

Q. But you think it is sufficiently deep to carry it down under the valley? A. I believe it, yes.

Q. I show you a picture purporting to be taken on the Obey lode. See if you recognize the hill.

A. Yes, sir.

Q. That is a view looking south, at tunnel No. 4 of Exhibit 1, and at the stripping done on the outcrop of the vein. Do you recognize that?

A. Yes, sir.

Q. And the one below it, taken from dump at tun-

(Testimony of Robert N. Bell.)

nel No. 1? A. Yes, sir.

Q. That is a fair representation of the mountain there, and the strike of the vein?

A. Yes, of the part that was covered by that.

Q. Yes—forming the west side of Gertch Hollow, which is a subsidiary gulch tributary to Montpelier Creek, and Montpelier Creek seems to cut the axis of the mountain almost at right angles. (Submitting said photograph to the witness, who examined the same.) [865]

Mr. JACK.—We offer that in evidence, for the purposes of illustration.

Mr. BUDGE.—We object to the introduction of this exhibit, upon the ground that it contains explanations, or purported explanations, upon which there is no testimony; and the foundation has not been properly identified.

Mr. JACK.—I will furnish you copies for the other case.

Said photographs were thereupon marked for identification as Plaintiffs' Exhibit 2 and Plaintiffs' Exhibit 3, respectively.

Mr. JACK.—I will say that the explanations upon the exhibits are taken from the testimony of the witnesses in this case.

Q. Do you still adhere to your definition of a vein, and that the characteristics of the vein must be such as you stated?

A. Yes. The essential characteristics of a vein must show an altered condition of the rock, and a

(Testimony of Robert N. Bell.)

metallic-ore-bearing gangue—or the wall rock, I should say.

Q. You are familiar with lead deposits in limestone?     A. Yes, sir.

Q. Is the theory of the origin of such lead deposits that the mineral is carried up in solution through crevices or along the plane jointures of the several strata, and leaching out or cutting out the lime, and depositing the valuable contents of the waters in lieu of a lime carbonate?

A. Yes, sir; that would in a measure conform to my idea, [866] that the solutions which formed the lead ore came up through deep-seated fractures in the earth's crust, usually in the form of hot mineral solutions, containing acids, in combination generally, to form the sulphide, and that that acid solution invariably has an altering effect on the enclosing formations that the mineral finally rests in.

Q. And replaces the substance of the rock in which the metal is finally deposited?

A. It very frequently does so; yes.

Q. And is it a fact that it is more frequently found in limestone because the limestone yields more readily to such solution and replacement?

A. The best lead mines in the world are not found in limestone.

Q. Well, where they are found in limestone, is it not on account of the lime yielding more readily than the surrounding rock?

A. I think that is true, yes—a solution and metasomatism.

(Testimony of Robert N. Bell.)

Q. This process of replacement is known as metasomatic action? A. Yes, in a measure.

Q. In such deposits, isn't the metal found then corresponding with the formation of the original lime strata?

A. Conformably with the original lime strata?

Q. Yes.

A. There are numerous exceptions, where the metallic ore minerals conform with the original strata of the— [867]

Q. What is that?

A. I say there are numerous exceptions, where the metallic ores are found conforming with the bedding of sedimentary strata; but almost invariably connected with those conditions is the trunk fissure or feeding vein or channel through which those solutions rose from the interior bowels of the earth to their localized position.

Q. But the mass of the metal would be found as conforming to the strike of the original beds, and conforming in appearance to the original bed?

A. Physically conforming, but invariably to my mind would show the altering effects of its nature on the enclosing walls or beds.

Q. In such a deposit as that, does the body of ore terminate abruptly; or does it extend out into the lime-bed in the form that is known as "feathering"?

A. Frequently in your country it "feathers" out in the bed; but invariably shows spur-joints in the joints of the beds, and shrinkage planes would be more or less mineralized.

(Testimony of Robert N. Bell.)

Mr. BUDGE.—You mean by “in your country”—do you mean in Utah?

WITNESS.—In Utah; yes, sir.

Mr. JACK.—Q. And isn't that true generally, where lead deposits are found in limestone?

A. I think that is the general rule.

Q. In that case, is the cleavage between the ore deposit and the wall rock clear and distinct, with the altered appearance, [868] and having a selvage?

A. There are conditions in formations, I presume, including limestone, where the division is not clear; where it may gradually blend from ore into country rock, and shade out insensibly until they are both pure, graduating from pure ore to pure country rock, without any distinct line of demarcation.

Q. Then, you still adhere to your statement that one of the essentials of a vein is that the walls shall be clear and distinct, with a selvage, and showing an altered appearance at the point of contact with the ore body?

A. That would be an altered appearance.

Q. But not an alteration in the rock itself?

A. It would be an alteration in the rock itself. You could readily distinguish what had been limestone from its usual structural appearance left. For instance, illustrating: In Park City there are places adjacent to the fissures, even to the bedded deposits to lead ore that you describe, where the limestone, after the lead has been deposited there, still on one side of the ore body being a channel for the circulation of silicious water, which has changed the pure



(Testimony of Robert N. Bell.)

limestone into what is now almost pure quartzite, replaced the lime particles with silica particles, but still retained the structural markings and characteristics of the limestone, so that you can see that it unquestionably was a limestone before it was silicified.

Q. Silica particles are carried up in hot solutions when they are deposited, is the usual theory, is it—is the accepted theory?

A. The solutions might vary in temperature—silicious solutions. [869]

Q. And the alteration in the wall rock in the case you are discussing is marked and noted?

A. Very decidedly. You can follow along the wall in places and find where the silicious solutions, for some reason—the tightening of the joints or channel of circulation—has prevented their action, and the pure lime comes in actual contact with the ore.

Q. Always in this feathered edge in the lime wall, we will find the point of contact with the ore, or a few inches back or a foot, is altered in appearance, and becomes more silicious?

A. There is invariably a condition of change in some form. It may be a simple silicious facing on the general country rock that may not be over a quarter of an inch thick. But it will show some condition of alteration where acid solutions of metallic ores have been in contact with it, or in the gangue's contact, sometimes an actual welding of one formation into the other.

Q. The accepted theory as to these ore deposits, as you have stated, is that the mineral is carried up in

(Testimony of Robert N. Bell.)

hot vapors, or hot waters, from the interior of the earth?

A. Yes, that is the general one—accepted.

Q. Isn't it true that the veins become enriched by the leaching out of upper rocks, and the mineral contents from the surrounding rocks are redeposited in the vein, thus enriching the metallic substance of the vein, in a great many cases?

A. That is a very common occurrence and experience.

Q. In regard to this deposit in question, wouldn't that theory as to the origin of the phosphoric acid in this rock be equally applicable? [870]

A. No.

Q. You think it would be unreasonable to assume that the phosphoric acid was carried up in solution in hot waters or hot vapors, and deposited in the limestone, the same as lead or other substances?

A. I think it would be decidedly unreasonable to suppose that the phosphoric acid in the free state you have came up in that form. It is unlikely that it would have remained in its apparent sedimentary form, if it had originated as you state. Your proposition would involve the origin of the phosphoric acid to have occurred in a manner such as the apatite veins occur.

Q. Is it your theory that the apatite veins occur in that manner?

A. I am candid in my belief that they do.

Q. What is the difference between the contents of this deposit and apatite?

(Testimony of Robert N. Bell.)

A. The difference is that the apatite calcium phosphates are invariably crystalline, and show the evidence of solphataric action.

Q. In this case, you say?

A. No—in the case of apatite veins.

Q. And is that true in regard to this deposit?

A. No—absolutely the opposite. There is no evidence of solphataric action in connection with these deposits.

Q. What works have you read in regard to this kind of a deposit?

A. Why, I have read all the recently published reports of the United States Geological Survey.

Q. Who prepared those reports that you have read? [871]

A. Why, principally Mr. Weeks, and Ferrier, and Richards, and Blackwelder, and Gale, and Gerty; and I have read other reports that I can't now recall the title of, and I have been a constant reader of the trade journals in the business for 25 years, in the course of being familiar in a general way with the nature and origin of the southeastern phosphate deposits, and apatite deposits, etc.

Q. You think it is unreasonable to assume that the phosphoric acid came up in solution, the same as the valuable minerals in other deposits—in metallic deposits? A. In this case?

Q. In the case of phosphate deposits, in this case, or in similar formations? A. In this case—

Q. In this case do you refer to this particular deposit, or to this western deposit of phosphates in

(Testimony of Robert N. Bell.)

Western States?

A. The Western oolitic phosphates I consider—I consider it is unreasonable to suppose that they could have ascended as hot solutions, such as other ore sources are formed from.

Q. The phosphoric acid is in the interior of the earth, the same as other substances composing valuable mineral deposits, is it not?

A. It is very generally disseminated.

Q. So there is nothing unreasonable in the supposition that they are carried up by the subterranean waters and vapors in that respect, is there?

A. Well, the only unreasonable feature is that there is not any fissuring, or evidence of a direct connection with the interior of the earth, in this case. It was laid down on the surface of [872] the earth.

Q. Isn't there fissuring along the bedding-planes between the several strata composing the crust of the earth where this deposit is found?

A. No; I didn't notice any fissuring at all. There is very little movement. The only evidence of movement is where the pits have been locally disturbed in the process of the formation or folding of the anticlines.

Q. Isn't there a fracture along the planes of the several strata?

A. No fractures, no sir. The beds are conformable; they don't fracture. They follow the surface, in other words.

Q. Isn't there always a point of least resistance between the different strata?

(Testimony of Robert N. Bell.)

A. There is a point—there is a line of least resistance, unquestionably, due to the difference in the texture of the different beds; but in spite of that fact, and in spite of the unquestionable folding and disturbance of the strata, there is a very little slipping or movement of one bed on the other, in this case.

Q. What is your theory as to the origin of the phosphoric acid found in this immense deposit?

A. My theory is that it is a surface precipitation in the shallow ocean water of a marine plateau. The origin may have been, as it is evident from the overlying cap lime, of enormous development of organic life; and as we know that organic animal life is very rich in phosphoric acid, some condition may have arrived at that period or age that destroyed or killed that animal life, and that the bodies of that animal life, which is shown [873] in such innumerable myriads, as exhibited by the fossils of the cap lime, I can readily conceive could be rotted, and give up their soluble phosphoric acid into the solution of the body of water in which they occurred; and that the action of some other form of bacteria or microscopic organisms still existed that had the ability to precipitate that phosphate.

Q. Secrete—

A. Secrete—I thank you for the word.

Q. Secrete phosphoric acid?

A. Secrete that phosphoric acid from its solution in the ocean water, together with lime carbonate, and form these little pebbles, oolites, or nodules of lime phosphate, as we now find them. Another probable



(Testimony of Robert N. Bell.)

source of the phosphoric acid would be the evidence of this marine animal life in the form of shell-fish, would probably warrant the belief of the existence of bird life in enormous myriads has existed, by the exhibition of bird guano or manure on the South American coast, in beds 100 feet thick or more, or very soluble phosphoric acid, and such beds of guano may have existed on the land border of these shallow oceans and have been leached by rains and carried by streams into the waters of the ocean in question, and there precipitated as before, by secretion.

Q. Then, as I understand you, the bottom of this ocean where the deposit was made, consisted of a lime formation? The lime was there?

A. The lime floor was the basal lime, yes.

Q. And that is what we find in connection with this deposit? A. Yes, sir. [874]

Q. And the sulphuric acid—

Q. Phosphoric—

Q. —the phosphoric acid was precipitated from the water and united with the lime at the bottom, forming this phosphate?

A. No, I don't think that. I think the lime was also in solution with the phosphoric acid, and the two precipitated together, in unison.

Q. But they united before they precipitated?

A. They united coincidentally with their precipitation.

Q. Yes—they were both deposited together?

A. Yes, sir.

Q. And united in this bed? A. Yes.

Q. You spoke about the phosphoric acid being

(Testimony of Robert N. Bell.)

leached out and precipitated into the water. Isn't it true that that leaching or precipitation from the upper layers as they now exist, or after the first bed was formed, probably took place and leached down, so that the upper strata would be less valuable for the phosphoric acid than the lower strata? In other words, enriching the lower strata?

A. No, for the reason that after phosphoric acid—my understanding of it is—is fixed in the form we now find it, that it is very slightly soluble; while in its original guano form it is very soluble; and if the upper beds had been leached after they were fixed and formed into rock, the effect of that leaching would be evident in the passage of that acid from one bed to the other, by altering the strata in between.

Q. Isn't it true that the weathered portions of this deposit have been leached more or less, and contain less phosphoric [875] acid than the rock below it?

A. I don't admit that that is true. My understanding from the practical men in authority and experience who are handling this material, and know the actual results of such matters, is that there is hardly any difference—

Q. You say "hardly any difference." Is there any difference?

A. There may be a slight difference. Any mineral is liable to a surface alteration, but some of them to very slight alterations.

Q. Did you ever make an analysis, or have any

(Testimony of Robert N. Bell.)

made for the purpose of ascertaining that fact?

A. No. I have taken it for granted, on account of the great volume of evidence introduced in this case covering that point, that those facts were correct—substantially so.

Q. You don't know, outside of what you have heard in this case?

A. Well, in this case, and the results of the analyses of the United States Geological Survey, which were made for the purpose of determining the facts without any bias.

Q. Well, I say, that is the source of your information? A. Yes, sir.

Q. You say you got your information from men actually working with these deposits?

A. Yes, sir.

Q. You mean the employees of the San Francisco Chemical Company? A. Yes, sir.

Q. Is it not a plausible theory that the position now [876] occupied by these phosphate beds was formerly a bed of oolitic limestone, and that the ascending and descending waters containing phosphoric acid in solution might by the same metasomatic process that we have in the other deposits have replaced the oolitic limestone, and left the original bed in its present condition as phosphate ore?

A. No; it seems physically impossible to my view of its origin, for the reason that there is not any evidence of any other substance that has been replaced. The oolites, if they had been replaced as you suggest, would not have been uniformly replaced. As I

(Testimony of Robert N. Bell.)

have stated in the case of the Park City metamorphosed limestone into quartzite, there is a graduation and a difference in different parts of the vein or wall rock in question, and there could not be such a uniform metasomatosiis—

Q. This phosphate deposit, as it occurs now, is not in the same form, or is not the same rock as the original limestone—oolitic limestone bed—is it?

A. I think it is, absolutely, without any question.

Q. That is the original limestone bed?

A. I think it is. I think it was formed as a—

Q. Then how does it differ from the rock above and below? Isn't that oolitic limestone below it?

A. No.

Q. Is it oolitic limestone above it? A. No.

Q. Is it limestone at all? A. It is.

Q. But not oolitic?

A. Not oolitic, in the sense that this bed is oolitic.  
[877]

Q. The intervening layers in this strata, are they oolitic limestone? A. Some of them are.

Q. Some of them are? A. Yes, sir.

Q. And now is that intervening layer that you say is oolitic limestone the same as the phosphate bed?

A. Those narrow layers of oolitic phosphate rock are conditions and beds that were formed under similar conditions to the lower beds, at a subsequent time.

Q. And what do you mean by saying that the phosphate bed is the original oolitic limestone bed? Do you mean that it is the same as the layer above it?

(Testimony of Robert N. Bell.)

A. Well, it is the first one that was laid down in that series. It was made and finished and completed and partly consolidated, and then a changed condition occurred in the marine life and a different form of rock was deposited.

Q. Yes, and then—?

A. Then, the original condition was repeated, and another layer, not so thick, was formed, under similar conditions as the lower bed—just simply a repetition of the—

Q. The phosphate bed—referring to the lower bed—is an oolitic limestone bed, is it?

A. It is an oolitic bed of lime phosphate—not an original oolitic limestone.

Q. Then, it has been replaced by something, or changed by something from its original state as an oolitic limestone bed, has it not?

A. I say it is not an oolitic limestone bed. It is an [878] oolitic phosphate bed—calcium phosphate.

Q. That is the question I asked you: Is it not reasonable to suppose that the original oolitic limestone bed has been changed, and the phosphoric acid has been substituted for some element in the oolitic limestone bed, thus converting it into a phosphate bed?

A. I beg your pardon. I misunderstood your question.

Q. I thought you misunderstood me.

A. I did. I wish to correct my answer, if I have conveyed that idea.

Q. Yes.



(Testimony of Robert N. Bell.)

A. My idea is that it is not an original oolitic limestone bed; it is an original oolitic calcium phosphate bed.

Q. I just asked you if the theory was not reasonable, that it might have been an original oolitic limestone bed and have been changed by metasomatic action, by which the phosphoric acid penetrated the original bed and substituted this phosphoric acid for some other ingredient, thus converting it into lime phosphate instead of lime carbonate? Isn't that a reasonable theory and explanation for it?

A. No, I think that is a decidedly unreasonable theory.

Q. Why is it more unreasonable than the case of the lead deposits in the limestone?

A. As I have previously explained, the absolute uniformity of texture of these amorphous pebbles, from one end of the property to the other, for nearly three miles, and as I am informed for hundreds of miles, has never been known to occur in any metallic matasomatosis, in such regularity.

Q. The origin of these phosphate deposits and the origin [879] of the phosphate is purely a matter of theory, is it not? A. I don't think so.

Q. Is it a case of knowledge?

A. I think there are cases of absolute knowledge.

Q. Well, is this a case of absolute knowledge?

A. Well, there is nobody living that saw it done, that's a fact; but the conditions are such—

Q. No—that is a fact—

Mr. BUDGE.—Well, let him explain that.

(Testimony of Robert N. Bell.)

Q. You are entitled to your theory, as well as anyone else.

A. Investigations for the purpose of demonstrating these facts have been carried out at enormous expense, to this and other governments of the world, for a number of years, and it is the common sense conclusion of the most scientific minds of the world that it did occur under those conditions.

Q. Yes; but then at best it is only a theory is it not?

A. Well, it is more than a theory. If I can see a shell on the surface of the earth, with a snail in it, of a definite form, and I can go on to the sea shore and I can see another shell, with an animal body in it like a mussel or a clam, alive, and see it move and breathe, I know that it exists. If I go into the solid rock and see the fossil remains of a shell in just as perfect detail as the one that is alive to-day, I am positive in my own mind that it existed; that it lived and had a body and breathed and existed under the conditions of the one that I see before my eyes.

Q. And in that sense it is—

A. In that sense it is a fact, and not a theory.  
[880]

Q. You say you don't think it is reasonable to assume that the leaching process has accounted for the richness in certain portions of this deposit?

Mr. BUDGE.—Mr. Jack, I don't want to interpose any objection, but we have been over—that is, you have been over that leaching process at least ten times, or twelve, and it strikes me that it is encum-

(Testimony of Robert N. Bell.)

bering the record to go over it again. It has been gone over and over and over and over.

A. My understanding is, as I have previously stated, that the phosphoric acid is a decidedly fixed acid, and not subject to leaching by ordinary surface placer influences. It could only be under conditions of internal solphataric heat that it could be made soluble and leached and re-precipitated.

Q. Well, you can make that short. I will ask you if you didn't acknowledge that as a reasonable theory?

A. That these beds had been leached and enriched?

Q. Yes.

A. I will admit that, to a very slight degree.

Q. How do you account for the lower bed being so much richer than the upper strata?

A. Why, I don't account—I don't acknowledge that it is. I think it is just as rich in the upper strata as it is in the lower strata—simply a difference in quantity.

Q. What kind of locations do you as a miner recognize—just the two classes?

A. Oh, there are various kinds of locations, covering different kinds of mineral. [881]

Q. Are they not either lode or placer?

A. Or coal.

Q. Is that a mining location?

A. Yes, sir; a coal location is a mining location. It is made for the purpose of mining coal.

Q. Outside of coal do you recognize more than the two—placer and lode locations?

(Testimony of Robert N. Bell.)

A. In connection with mineral deposits, do you mean?

Q. I mean with a mineral ground.

A. No, I don't just think of any other that I could use; and if I couldn't use anything but a lode claim on a mineral deposit, I surely would use it.

Q. You are a practical miner? A. Yes, sir.

Q. Of many years' experience? A. Yes, sir.

Q. You have located many claims, both placer and lode? A. Yes, sir.

Q. You attempt to locate them under the provisions of the law, do you not? A. Yes, sir.

Q. Section 2320 of the United States statutes provides for the location of what are known as lodes or veins? A. Yes, sir.

Q. Now, that provides for locations upon veins of quartz containing gold or other valuable deposits, does it not? A. Yes, sir.

Q. It also provides for locating other rock in place, containing gold or other valuable deposits, does it not? [882]

A. Yes; but it necessitates a vein or lode before you can locate the other rock in place; you must have a vein or lode.

Q. The statute does not say so, does it Mr. Bell?

A. It does; the succeeding section says that before you can make a valid location you must discover a vein or lode.

Q. Does it not say you must discover rock in place?

A. A vein or lode must be discovered before a

(Testimony of Robert N. Bell.)

valid location can be made on any kind of a lode.

Q. That is your idea of the law? A. Yes, sir.

Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a certain manner, it is contrary to your understanding of it, is it? A. I don't quite understand the question.

(Said question was repeated, as follows:)

“Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a certain manner, it is contrary to your understanding of it, is it?”

A. My understanding of the statute is—

Q. Just answer if that is contrary to your understanding.

Mr. BUDGE.—Just read that question again, Mr. Hamer. I don't understand it.

(Said question was again repeated, as follows:)

“Q. Then, if the statute provides that mining claims upon rock in place, containing gold, silver or other valuable deposits, must be located in a [883] certain manner, it is contrary to your understanding of it, is it?”

Mr. BUDGE.—That is incompetent, and I object to it as calling for a conclusion of law, and assuming something that is not in evidence.

Mr. JACK.—Q. You may answer if that is contrary to your understanding, if that is the provision of the statute?

A. My understanding of the provision of the stat-



(Testimony of Robert N. Bell.)

ute is, that you must first have a vein or lode to locate rock in place or a placer deposit.

Q. And is this other construction contrary to your understanding?

A. I don't understand that the statute permits the location of rock in place as a lode, without discovering a vein or lode first.

Q. For placer locations the provision is that all other forms of deposit—valuable deposits of mineral except rock in place, can be located as placer, is it not?

A. The provision of the placer law is that certain substances contained in rock in place can be located as placer, as well as loose substances.

Q. Under the general mining law?

A. Under the general mining law, the way I understand it. And there are numerous illustrations of it having been legally done.

Q. And those substances not specifically mentioned in the statute that may be located as placers, must be located according to whether they are in rock in place or not? Isn't that true? [884]

A. Well, they must be located, but their character would govern the manner in which they must be located.

Q. The character of the—

A. —of the substance.

Q. —of the substance?

A. Of the substance, yes, and the condition under which it occurred.

Q. Do you agree with this definition of a vein or

(Testimony of Robert N. Bell.)

lode: "By veins or lodes, as used in the statute, are meant lines or accretions of metal embedded in quartz or other rock in place." Do you agree with that definition of a vein?

A. That would cover some forms of lodes or veins—that definition.

Q. But not all?

A. Not all forms, particularly—

Q. It would have to be a metallic substance, would it?

A. Not necessarily. I can conceive of—

Q. What forms would it not cover?

A. Why, the lodes or veins have such a wide diversity of forms that I don't know. There are some that it would not specifically cover, I think.

Q. Would any form of deposit that answered that definition be a lode or vein?

Mr. BUDGE.—Just read that definition again, will you, Mr. Hamer, please?

(Said question was repeated, as follows:)

"Q. Do you agree with this definition of a vein or lode: 'By veins or lodes, as used in the statute, are meant lines or accretions of [885] metal embedded in quartz or other rock in place.' Do you agree with that definition of a vein?"

A. No. That would be an indefinite definition, because that would include beds of mineral matter, unaltered, that were not lodes.

Mr. JACK.—Q. That would not include all forms of deposit?

(Testimony of Robert N. Bell.)

A. All forms of lode or vein deposits?

Q. Yes.

A. No. That would come under the requirement—under the lode mining law.

Q. Do you agree with this definition: “All forms of mineral or mineral gangue in place, whether fissure or contact veins, or impregnations or other irregular deposits, should be construed to come within the expression ‘veins or lodes,’ used in the Act of Congress, and as such be subject to location and patent under the Act.” Do you agree with that?

WITNESS.—I will ask you to read that again, Mr. Hamer.

(Said question was repeated, as follows:)

“Q. Do you agree with this definition: ‘All forms of mineral or mineral gangue in place, whether fissure or contact veins, or impregnations or other irregular deposits, should be construed to come within the expression “Veins or lodes,” used in the Act of Congress, and as such be subject to location and patent under the Act.’

Do you agree with that?” [886]

A. No, sir; there is an exception to the proposition you put.

Q. What is the exception?

A. That mineral bodies bedded would not be locateable as a lode or vein in every instance. There are numerous instances and conditions, with proper connections, under which those bedded mineral deposits might come under the lode mining law; but those conditions—attendant conditions—must exist,

(Testimony of Robert N. Bell.)

to make a bedded mineral deposit eligible for that statute.

Q. You have no interest in any phosphate deposits yourself, have you? A. Absolutely none.

Q. When did you first investigate these phosphate deposits?

A. I saw this phosphate rock first in 1903, and since then my next investigation of it was after reading about it for several years of the experience of others, on the 24th of May of this year—wasn't it?

Mr. BUDGE.—I think it was the 20th.

Mr. JACK.—Q. Well, this year, was it, some time? A. This year, yes.

Mr. JACK.—That's all.

Redirect Examination.

(By Mr. BUDGE.)

Q. Now, Mr. Bell, you have been interrogated as to lead or galena deposits along the bed stratification. I call your [887] attention to the illustration shown on page 100 of the Syllabus of Economic Geology, by Bryner & Newsome, the second illustration appearing on page 100, and ask you if that is your idea—if that presents your idea of the manner in which the stratification is affected by a galena deposit, along the bed?

A. Yes; that illustrates the divergence of the ore solutions from a regular channel.

Q. In other words, I understand you that while galena deposits sometimes conform to a bed—to the bed in which they are found—to some extent, that

(Testimony of Robert N. Bell.)

they break through, at various places, the stratification which adjoins the particular bed in which a portion of the deposit may be found?

A. Yes, sir; and that condition is so well recognized that it is mentioned in the mining statute, and covered by dips, spurs and angles, which are known to be so common to all lode and vein deposits.

Q. And where the galena deposit runs along the bed, is it not also true that there will remain within that galena deposit which lines along the bed, a portion of the rock or sedimentary deposition which was there before the galena came into the bed?

A. Yes, sir; it is almost invariably the rule that there is a blending of the formation that has been replaced with the ore that has replaced it, if not absolutely digested or absorbed.

Q. Where the galena comes into a bed, the joint planes or cleavages of the rock adjoining the bed in which the galena may appear—that is, on either side of the galena deposit along the bed,—would be mineralized to some extent? A. Almost invariably.

[888]

Q. Calling your attention to Defendant's Exhibit 4, and to the limestone marked two feet in thickness, which immediately overlies the five-foot five-inch main phosphate bed. I will ask you whether, if a phosphate deposit had been injected in solution, the joint-planes shown in that cap limestone above the five-foot bed would not have been mineralized?

A. It would be impossible for the injection of solutions up that bed (which would have to be under



(Testimony of Robert N. Bell.)

heavy pressure to be injected against such a structure) to have failed to have leaked into those joint-planes, if they were open at that time, and they probably were.

Q. And there is no evidence whatever—

A. From my inspection of the particular bed in question, I didn't see any evidence of any leaching or precipitation of the phosphatic material in those joint-planes.

Q. And from your investigation of the series of beds, did you notice any indication or evidence of the precipitation or conveyance of any substance from one bed to another?

A. No. I don't believe there has been any. In fact, the layers between the principal beds and the lower beds above the cap lime are of a shaly nature, and impervious, practically—I won't say impervious, but decidedly less pervious than the limestone, and the solutions would travel along rather than through those shaly beds, and I don't believe that there has been any transmission of phosphoric acid from one bed to the other.

Q. Well, is there any evidence of this stratification being broken in any part of this bed that you examined; and by that I mean any fracture of the stratification?

A. There are some small fractures by recent disturbances, but [889] no discontinuity of the beds; they are uniform, one above the other, and they are not replaced one with the other. They thicken and thin; but apparently each member is represented—

(Testimony of Robert N. Bell.)

or each section I saw of the deposit for several miles along its length.

Q. And each bed distinct from the other?

A. Yes.

Q. Calling your attention to this exhibit which has been introduced by the plaintiffs, called Plaintiff's Exhibit 3. Now, I will ask you, Mr. Bell, whether as a matter of fact the line drawn on that photograph is the strike of the bed or the outcrop?

A. It is not the strike of the bed, it is the outcrop of the bed, and the line, after a closer inspection of it, seems to have been wilfully deflected from the line of the outcrop in this lower picture.

Q. You say it is not the strike of the bed?

Mr. JACK.—That it is not intended to be accurate—just to indicate—

A. There is a divergence there of  $45^{\circ}$ . Here is the line of the outcrop, and there is the line of the strike. (Indicating upon said photograph.)

Mr. JACK.—Well, "outcrop" is probably as good a word as "strike."

Mr. BUDGE.—Q. Well, in this photograph, at the particular point supposed to be represented by the photograph, the outcrop as it appears in this photograph would not be the strike of the bed? [890]

A. Not necessarily, no.

Q. Well, do you know as a matter of fact whether it is the strike?

A. I think it is not the true strike.

Q. Now, when you say, Mr. Bell, that in your judgment the formation of this bed of calcium phosphate

(Testimony of Robert N. Bell.)

was brought about by these various forms of animal life, and by the washing in by the wave action of the deposits of guano or other phosphatic materials, and that this phosphoric acid was precipitated, and thus formed this bed, and that it was precipitated with calcium; did you wish to convey the idea that the calcium mentioned which was precipitated with the phosphoric acid was the bed of calcium carbonate underneath? A. No.

Q. Is it your idea that this bed of calcium carbonate existed before any of this bed?— A. Yes, sir.

Q. —of phosphate rock was laid down?

A. That is my impression.

Q. And the calcium which was precipitated with the phosphoric acid was simply the calcium which was in the water? A. Yes, sir, absolutely.

Q. Now, what is the proportion, Mr. Bell, of veins or lodes in igneous and in sedimentary rocks?

A. Why, I think that volcanic phenomena is the primal cause of the origin of lode and vein deposits, and that fully 90% of all the valuable metallic ore deposits in the world are associated either in or in contact with or in close association with igneous rock, which accounts in a large measure for [891] their origin from deep-seated sources. These igneous rocks are known to penetrate the interior bowels of the earth, and afford channels for the ascension of the mineral solutions and the heavier metallic minerals.

Q. What have you to say as to whether this is an igneous rock formation here in this deposit?

(Testimony of Robert N. Bell.)

A. I think it is decidedly the opposite of an igneous formation. It is a cold water laid formation, on the surface of the earth, and I did not see any evidence of igneous intrusion anywhere in the vicinity of these deposits.

Q. Now, have you any other reasons than what you gave on yesterday why this is not a vein or lode, in your opinion?

A. Why, I might say that my reasons are that it is of such uniformly regular bedded appearance, of unquestioned sedimentary origin, that has remained practically unaltered since it was formed, and that on the other hand a lode or vein is a very irregular deposit, or such deposits vary in form so widely that there is a decided contrast in the bed; together with the fact of the irregularity and uncertainty of the action of a vein below the surface, the statute provides an extralateral right, which generally also conveys a lawsuit to the claimant of the ground.

Mr. JACK.—Conveys a what?

A. A lawsuit. The difference between this deposit and a lode deposit, as an average of lode deposits, is one of uniformity; in this instance of a surface sedimentary mineral, as contrasted to an irregular, indefinite form of a mineral deposit, as may be covered by the lode or vein mining law.

Mr. BUDGE.—Q. What have you to say as to how the stratification is [892] respected by veins or lodes?

A. It is usual and very common to find vein or lode deposits cutting the enclosing formations, in both

(Testimony of Robert N. Bell.)

strike and dip, and rather unusual to find them conforming to the bedding enclosing formations as the deposits do. In other words, the lode or vein deposits are absolutely strangers to their environments; and this is a conformable, consistent sedimentary deposit that belongs in the position in which it originated.

Q. Well, where they do conform—where veins or lodes do conform to the bedded stratification, it has been by a process of replacement?

A. By a process of replacement, and the channel of the solutions which did the replacing is usually at a different angle from the bed, and almost always in evidence.

Q. And it mineralized the joint-planes adjoining?

A. Yes, sir.

Q. The joint-planes of the country rock?

A. Yes, sir.

Mr. BUDGE.—I think that's all.

Judge DEY.—That's all.

Mr. BUDGE.—I want to have it understood, if it is agreeable to you, that Mr. Glenn's testimony go in as part of the Wyoming case, if you haven't any objection.

Judge DEY.—Glenn was about what—taking up coal?

Mr. BUDGE.—Yes.

Judge DEY.—Oh, well, I don't care.

Mr. BUDGE.—Now, Mr. Hamer, will you take [893] down what I am about to say? In the Idaho case solely, at the taking of depositions, counsel for



the defendant put in evidence certain correspondence and telegrams between Messrs. Goodfellow and Eells, and Messrs. Dey & Hoppaugh. Counsel for the plaintiff asked for the production of the letter of April 15th, 1910, written by Dey & Hoppaugh to Goodfellow and Eells, which has now been produced, and which we now offer, and ask to have marked as an exhibit.

(Said letter was thereupon marked Plaintiffs' Exhibit<sup>4</sup>, and the same is in the words and figures following, to wit:)

**[Plaintiffs' Exhibit No. 4.]**

Salt Lake City, Utah, April 15, 1910.

Messrs. Goodfellow & Eells,

Counsellors at Law,

430 California Street,

San Francisco, Calif.

Gentlemen:

Referring to the annual assessment work required to be done by Messrs. Duffield and Jeffs on certain lode mining claims claimed by them and situate in Bear Lake County, Idaho, over which we had an understanding in reference to assessment work for the year 1908 following bill of complaint filed by Duffield and Jeffs in the U. S. Circuit Court of Idaho: [894]

The understanding we refer to is embodied in a letter from us to you under date of November 19, 1908; your telegram of November 23, our reply November 24th and confirmatory letter of the same date. Since that time we have not heard of the mat-

ter until today. Now we are informed that Messrs. Duffield and Jeffs were permitted to do the assessment work, not only for 1908 but for 1909, and now we desire to do the work for the current year. Assuming that they could do the work for this year, the same as they did last year, they prepared to do the work and have been notified by the San Francisco Chemical Company's agent that they are trespassing.

We submit the matter to you with the hope that an amicable arrangement can be reached whereby the work for this year may proceed peaceably upon the express stipulation, however, as heretofore: i. e., that the work that has been done and will be done shall be without disturbing the possession of the Chemical Company or prejudicial to any rights they may be able to establish.

Yours truly,

DEY & HOPPAUGH.

CCD HDC.

(The above letter was written upon the letter-head of "Dey and Hoppaugh, Counsellors at Law, Auerbach Block, Salt Lake City, Utah.") [895]

Judge DEY.—Mr. Budge, have you the original letter from C. B. Jack to Mr. Joseph J. Taylor, dated April 21, 1910?

Mr. BUDGE.—I don't think I have, Judge.

Judge DEY.—I submit to you a copy. (Handing same to Mr. Budge.)

Mr. BUDGE.—If you say this is a copy, it is all right.

Judge DEY.—Mr. Jack says it is a copy.

Mr. BUDGE.—All right.

Judge DEY.—And we offer that likewise, to be read into the record.

(Said letter was marked Plaintiffs' Exhibit 5, and the same is in the words and figures following, to wit:)

**[Plaintiffs' Exhibit No. 5.]**

Salt Lake City, Utah, April 21, 1910.

Mr. Joseph J. Taylor,

Agent—San Francisco Chemical Co.,  
Montpelier, Idaho.

Dear Sir:

We have your notice to Morse S. Duffield in reference to work upon phosphate claims near Montpelier. Previous work was done under an agreement between us and Mr. Goodfellow that it should be without prejudice to rights involved in dispute between us. We have written Mr. Goodfellow that present work is to be done under the same conditions as contained in said stipulation [896] and you will probably hear from him soon that it is all right to allow Mr. Hoff to proceed with the assessment work upon the Duffield and Jeffs claims.

Respectfully,

C. B. JACK.

Mr. BUDGE.—It is understood, Judge Dey, that the Examiner attach copies of these exhibits which we agreed might be duplicated, and attached to the Wyoming record?

Judge DEY.—Yes, sir.

Mr. BUDGE.—And the record in the Wyoming case, that the two—that as to both, the Wyoming

cases, they are to be one record?

Judge DEY.—One record, yes.

Mr. BUDGE.—And that the evidence be considered as applicable to both cases?

Judge DEY.—To both cases, or to the consolidation of the cases.

Mr. BUDGE.—Yes.

Judge DEY.—Either way, as the Court may desire.

Mr. BUDGE.—Yes, that's it. [897]

**Defendant's Exhibit No. 6.**

N.

4-201.

Register's Final Certificate of Entry.

Serial 07448.

Receipt No. 393355.

**DEPARTMENT OF THE INTERIOR.**

United States Land Office,

At Blackfoot, Idaho, May 23, 1911.

Mineral Entry No. ....

Survey Lot No. 2505.

Authorized by "N" May 18, 1911.

IT IS HEREBY CERTIFIED that in pursuance of the provisions of the Revised Statutes of the United States, Chapter VI, Title XXXII, and legislation supplemental thereto, UTAH FERTILIZER & CHEMICAL MANUFACTURING COMPANY, whose post-office address is Salt Lake City, Utah, on this day purchased that mining claim known as the "Hillside Group" placer mining claim, embracing the Hillside No. 1, Hillside No. 2, Highland No. 1 and Superior Extension placer claims (consolidated) in Sections 24, 25 & 36, in Township No. 10 South

of Range No. 44 East, Boise Meridian, and Secs. 19, 30 & 31 Tp. 10 S., R. 45 E. B. and Sec. 24, Tp. 11 S., R. 44 E. B. M. designated as Survey No. 2505 placer claim, as entered, embracing 540 acres, in the unorganized Mining District, in the County of Bear Lake and State of Idaho, as shown by [898] the plat and field notes of survey thereof, for which the said part. . . . first above named this day made payment to the Receiver in full, amounting to the sum of Thirteen Hundred and Fifty Dollars.

NOW, THEREFORE, Be it known that upon the presentation of this Certificate to the Commissioner of the General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a patent shall issue thereupon to the said Utah Fertilizer & Chemical Manufacturing Company, if all be found regular.

(Signed) HENRY W. KIEFER,

Register.

I hereby certify, this 20th day of June, 1911, that the above is a true and correct copy of the original Final Certificate issued by this office, as far as our records show.

HENRY W. KIEFER,

Register. [899]



**Defendant's Exhibit No. 7.**

N. 4-201.

Register's Final Certificate of Entry.

Serial 07447.

Receipt 393354.

**DEPARTMENT OF THE INTERIOR,**

United States Land Office,

At Blackfoot, Idaho, May 5, 1911.

Mineral Entry No. . . . .

Survey Lot No. 2497.

Authorized by "N" April 26, 1911.

IT IS HEREBY CERTIFIED That in pursuance of the provisions of the Revised Statutes of the United States, Chapter VI, Title XXXII, and legislation supplemental thereto, UTAH FERTILIZER AND CHEMICAL MANUFACTURING COMPANY, whose post-office address is Salt Lake City, Utah, on this day purchased that Mining Claim known as the "Highland" Placer mining claim, situate in Section 1, in Township No. 11 South and Sec. 36, Tp. 10 South, R. 44 E., Boise Meridian, of Range No. 44 East, Boise Meridian, designated as Survey No. 2497 placer lode mining claim, as entered, embracing 158.771 acres, in the unorganized Mining District, in the County of Bear Lake and State of Idaho, as shown by the plat and field notes of survey thereof, for which the said part.... first above named this day made payment to the Receiver in full, amounting [900] to the sum of Three Hundred Ninety Seven & 50/100 dollars.



address is Montpelier, Idaho, on this day purchased that Mining Claim known as the Layland Placer Mining Claim, for the E.  $\frac{3}{4}$  SW.  $\frac{3}{4}$  of SE.  $\frac{1}{4}$  of Sec. 18; the NE.  $\frac{1}{4}$  NW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$  of Sec. 30; the E.  $\frac{3}{4}$  SW.  $\frac{1}{4}$  of SE.  $\frac{1}{4}$ , the E.  $\frac{3}{4}$  NW.  $\frac{1}{4}$  of SE.  $\frac{1}{4}$ , the E.  $\frac{3}{4}$  SW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$ , and the E.  $\frac{3}{4}$  NW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$  of Section 19, in Township No. 27, North of Range No. 119 W. 6th P. Meridian, designated as Lot . . . . . No. . . . . Said Lot No. . . . . extending . . . . . feet in length along said . . . . . vein or lode, expressly excepting and excluding from said purchase [902] all that portion of the ground embraced in Mining Claim . . . . . or survey designated as Lot . . . . . No. . . . . and also all that portion of any vein or lode the top or apex of which lies inside of said excluded ground; said, as entered, embracing 160 acres, in the unorganized Mining District, in the County of Uinta, and State of Wyoming, as shown by the plat and field notes of survey thereof, for which said part first above named this day made payment to the Receiver in full, amounting to the sum of Four Hundred (400) Dollars.

NOW THEREFORE, Be it known that upon the presentation of this certificate to the Commissioner of the General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a Patent shall issue thereupon to the said San Francisco Chemical Co., a corporation by Joseph J. Taylor, its Agent and Attorney in fact;

if all be found regular.

Filed for record May 23, 1911.

THOMAS V. DAVIS,  
Register.

GEO. P. HARVEY,  
County Clerk.

The State of Wyoming,  
County of Uinta,—ss.

This is to certify that this copy of Register's Final Certificate of Entry is a true and exact copy of the original as examined by me.

In Witness Whereof I have hereunto set my hand  
and official seal this 31 day of May, A. D. 1911.

[Seal]

GEO. P. HARVEY.

County Clerk and Ex-Officio Register of Deeds.

[903]

**Defendant's Exhibit No. 9.**

41997.

Register's Final Certificate of Entry.

T. V. Davis to San Francisco Chemical Co.

N.

4-201.

Register's Final Certificate of Entry.

DEPARTMENT OF THE INTERIOR.

United States Land Office.

At Evanston, Wyoming, December 15, 1910.

Mineral Entry No. 02470.

Lot No. . . . .

IT IS HEREBY CERTIFIED That in pursuance of the provisions of the Revised *States* of the United States, Chapter VI, Title XXXII, and legis-

lation supplemental thereto, The San Francisco Chemical Co., a corporation by Joseph J. Taylor, its agent and attorney in fact: whose post-office address is Montpelier, Idaho, on this day purchased that Mining Claim known as the Layland Placer Mining Claim, for the E.  $\frac{3}{4}$  SW.  $\frac{1}{4}$  of SE.  $\frac{1}{4}$  of Sec. 18; the NE.  $\frac{1}{4}$  NW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$  of Sec. 30; the E.  $\frac{3}{4}$  SW.  $\frac{1}{4}$  of SE.  $\frac{1}{4}$ , the E.  $\frac{3}{4}$  NW.  $\frac{1}{4}$  of SE.  $\frac{1}{4}$ , the E.  $\frac{3}{4}$  SW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$  and the E.  $\frac{3}{4}$  NW.  $\frac{1}{4}$  of NE.  $\frac{1}{4}$  of Section 19, in Township No. 27, North of Range No. 119 W. 6th P. Meridian, designated as Lot . . . . . No. . . . . said Lot No. . . . . extending . . . . . feet in length along said vein or lode, EXPRESSLY EXCEPTING AND EXCLUDING from said purchase all that portion of the ground embraced in mining claim . . . . . or survey designated as Lot . . . . . No. . . . . and also all that portion of any vein or lode the top or apex of [904] which lies inside of said excluded ground; said, as entered, embracing 160 acres, in the unorganized Mining District, in the County of Uinta, and State of Wyoming, as shown by the plat and field notes of survey thereof, for which the said part first above named this day made payment to the Receiver in full, amounting to the sum of four hundred (400) dollars.

NOW, THEREFORE, Be it known that upon the presentation of this certificate to the Commissioner of The General Land Office, together with the plat and field notes of survey of said claim and the proofs required by law, a Patent shall issue thereupon to the said San Francisco Chemical Co., a corporation by Joseph J. Taylor, its agent and attorney in fact,



if all be found regular.

THOMAS V. DAVIS, Register.

Filed May 23, 1911, Book 54, Page 230.

GEO. P. HARVEY,

County Clerk, Uinta County, Wyo.

The State of Wyoming,

County of Uinta,—ss.

This is to certify that this copy of Register's Final Certificate of Entry is a true and exact copy of the original as examined by me.

In Witness Whereof, I have hereunto set my hand and official seal this 12th day of June, A. D. 1911.

[Seal]

GEO. P. HARVEY,

County Clerk and Ex-Officio Register of Deeds.

[905]

**Examiner's Certificate [to Testimony].**

I, Daniel Hamer, the Special Examiner heretofore appointed in the above entitled cause, do hereby certify that the witnesses Robert N. Bell, C. L. Breger, Thomas L. Glenn, Randolph H. Groo, Richard A. Sullivan, and Fred. B. Weeks, named in the foregoing transcript, were by me duly sworn to testify the truth, the whole truth, and nothing but the truth; that the testimony of said witnesses was taken by me at the time and place mentioned in the annexed transcript, to wit, at Pocatello, Idaho, beginning on Wednesday, the 21st day of June, 1911, and continuing from day to day thereafter, on Thursday, the 22d day of June, 1911, on Friday, the 23d day of June, 1911, and ending on Saturday, the 24th day of June, 1901; that the testimony of said

witnesses was taken by me in shorthand, pursuant to stipulation of counsel for the respective parties, and was thereafter reduced by me to typewriting, pursuant to such stipulation, and that the above and foregoing is a full, true and correct transcript of the testimony of said witnesses so taken by and before me as such Special Examiner; and I further certify that the copies of exhibits included in the foregoing transcripts are full, true and correct copies of the exhibits offered in evidence before me as such Special Examiner; and I further certify that I am not related to any of the parties to said action, and that I am not in any way interested in the result of said action.

DANIEL HAMER,  
Special Examiner. [906]

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*In the District Court of the United States for the  
District of Idaho, Eastern Division.*

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,  
Defendant.

**Decree.**

This cause came on regularly to be heard on the 5th day of January, 1912, pursuant to the stipulation of the parties upon the bill of complaint of the said complainants Morse S. Duffield and Lewis A. Jeffs, and the answer thereto of the said defendant,

San Francisco Chemical Company; upon the cross-bill of the said San Francisco Chemical Company and the answer thereto of said Morse S. Duffield and Lewis A. Jeffs and upon the replications to the said answers; also upon the evidence taken in said cause. The cause was argued by counsel for the respective parties and by the Court taken under advisement, who being fully advised in the premises, after due consideration of the pleadings and evidence, orders, adjudges and decrees, and it is hereby Ordered, Adjudged and Decreed that the said defendant and cross-complainant San Francisco Chemical Company, a corporation, is the owner by discovery and location, and has established its right to the possession and occupancy of the "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," placer mining claims, and each of them, described and claimed in the cross-bill of said San Francisco Chemical Company, and [916] every part and parcel of each of said placer mining claims, including all grounds in conflict with the so-called "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia" and "Wayne," lode mining claims of the said complainants, Morse S. Duffield and Lewis A. Jeffs, which said conflict area is more particularly described as follows, to wit:

(a) Beginning at corner No. 1 of the so-called Cumberland lode claim, according to the official survey thereof No. 2538, which is identical with corner No. 1 of the so-called Overton Lode Claim, and

from said common and identical corner the 1/4 section corner of the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears south 35 degrees 28 minutes east 182.3 feet, thence running from said common and identical corner aforesaid south 42 degrees 07 minutes west 1374 feet to the intersection with line 4-1 of the so-called Mt. Pleasant lode claim, thence north 49 degrees 43 minutes east 1346.6 feet to corner No. 1 of the said Mt. Pleasant lode claim, which is identical with the aforesaid 1/4 section corner, thence south 30 degrees 51 minutes east 600 feet to corner No. 2 of the said Mt. Pleasant lode claim, thence south 49 degrees 44 minutes west 12.7 feet to intersection with line 1-2 of the so-called Arkansas lode claim, thence south 57 degrees 49 minutes east 823.9 feet to intersection with the easterly side line of the Wizard placer claim, thence south along said easterly side line of said Wizard placer claim 545.3 feet to intersection with line 3-4 of the said Arkansas lode claim, thence south 31 degrees 22 minutes west 530.8 feet to corner No. 4 of the said Arkansas lode claim, thence north 57 degrees 49 minutes west 453.8 feet to intersection with the westerly side line of the [917] Wizard placer claim, thence north along said westerly side line of said Wizard placer claim 162.2 feet to intersection with line 5-6 of said Arkansas lode claim, thence north 55 degrees 01 minute east 257.6 feet to corner No. 6 of said Arkansas lode claim, thence north 16 degrees 15 minutes west 915.5 feet to intersection with line 2-3 of the said Mt. Pleasant lode claim,

thence south 49 degrees 44 minutes west 1263.4 feet to intersection with subdivision line between lot 3 and the southeast 1/4 of the Northwest 1/4 of section 6, township 13 south, range 45 east, Boise base and meridian, thence along said subdivisional line south 89 degrees 51 minutes west 215.2 feet to intersection with line 3-4 of said Mt. Pleasant lode claim, thence north 30 degrees 51 minutes west 459.2 feet to corner No. 4 of said Mt. Pleasant lode claim, thence north 49 degrees 43 minutes east 6.7 feet to intersection with line 2-3 of said Overton lode claim, thence north 45 degrees 22 minutes West 507.8 feet to corner No. 3 of said Overton lode claim, thence north 39 degrees 13 minutes east 1499.9 feet to corner No. 4 of said Overton lode claim which is identical with corner No. 2, of said Cumberland lode claim, thence north 41 degrees 08 minutes east 1461.5 feet to corner No. 3 of said Cumberland lode claim which is identical with corner No. 2 of the so-called Fentress lode claim, thence north 12 degrees 42 minutes east 694 feet to intersection with line 1-2 of the so-called Jimtown lode claim, thence south 77 degrees 43 minutes west 158.8 feet to corner No. 2 of said Jimtown lode claim, thence north 14 degrees 17 minutes west 1421 feet to corner No. 3 of said Jimtown lode claim which is identical with corner No. 2 of the so-called Obed lode claim, thence north 22 degrees 56 minutes west 1492.2 feet to corner No. 3 of said Obed lode claim which is identical with corner No. 2 of the so-called Obey lode claim, thence north 17 degrees 09 minutes west 1491.8 feet to corner No. 3 of said Obey lode [918] claim,



thence north 77 degrees 43 minutes east 600 feet to corner No. 4 of said Obey lode claim; thence south 14 degrees 29 minutes east 1487.4 feet to corner No 1 of said Obey lode claim, which is identical with corner No. 4 of said Obed lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 0 degrees 08 minutes west 5178.2 feet, thence running from said common and identical corner aforesaid south 24 degrees 28 minutes east 1500.4 feet to corner No. 1 of said Obed lode claim which is identical with corner No. 4 of said Jimtown lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 9 degrees 26 minutes west 3864.9 feet, thence running from said common and identical corner south 14 degrees 53 minutes east 775 feet to intersection with line 3-4 of said Fentress lode claim, thence south 45 degrees 22 minutes east 523.7 feet to corner No. 4 of said Fentress lode claim, thence south 15 degrees 07 minutes west 1465.5 feet to corner No. 1 of said Fentress lode claim which is identical with corner No. 4 of said Cumberland lode claim and from said common and identical corner the aforesaid 1/4 section corner bears south 32 degrees 44 minutes west 1522.8 feet, thence running from said common and identical corner aforesaid south 39 degrees 23 minutes west 1465 feet to the place of beginning. From corner No. 1 of said so-called Jimtown lode claim the aforesaid 1/4 section corner bears south 22 degrees 17 minutes west 2635.5 feet, and from corner No. 1 of said so-called

Arkansas lode claim said 1/4 section corner bears north 29 degrees west 589.3 feet. Said conflict area containing 142.044 acres.

(b) Beginning at corner No. 3 of the so-called Hickman lode claim from which post No. 2 of the said Hickman lode claim bears north 6 degrees 37 minutes west 258 feet and from said post No. 2 of the said Hickman lode claim post No. 1 of said Hickman lode claim bears south 83 degrees 15 minutes west 50 [919] feet; whence the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 7 degrees, 14 minutes west 2032 feet, thence running from said corner No. 3 aforesaid north 83 degrees 23 minutes east 239.9 feet to corner No. 4 of said Hickman lode claim, thence south 0 degrees 31 minutes east 991.6 feet to corner No. 5 of said Hickman lode claim, thence south 83 degrees 23 minutes west 248.9 feet to corner No. 6 of said Hickman lode claim, thence north along the westerly side line of the Wizard placer claim 992.6 feet to corner No. 3 of said Hickman lode claim and being the place of beginning. Said conflict area containing 5.532 acres.

(c) Beginning at corner No. 4 of the so-called Columbia lode claim and running thence south 44 degrees 29 minutes west 29.4 feet to intersection with line 1-2 of the so-called Wayne lode claim, said point of intersection bears south 62 degrees 08 minutes east 25 feet from corner No. 1 of said Wayne lode claim, from which the 1/4 section corner on the south boundary of section 31, township 12 south,

range 45 east, Boise base and meridian, bears north 3 degrees 17 minutes west 5503.9 feet, thence north 62 degrees 08 minutes west 1.8 feet to intersection with westerly side line of the Wizard placer claim, thence north along the westerly side line of the Wizard placer claim 25.1 feet to point of intersection with line 3-4 of said Columbia lode claim, thence south 77 degrees 22 minutes east along said line 3-4 of said Columbia lode claim 22.7 feet to the place of beginning. Said conflict area containing 0.007 acres.

(d) Beginning at corner No. 2 of said so-called Wayne lode claim, which is south 62 degrees 08 minutes east 50 feet from corner No. 1 of said Wayne lode claim, and from said corner No. 1 the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 3 degrees, 17 minutes west 5503.9 feet, thence running from [920] corner No. 2 aforesaid south 27 degrees 52 minutes west 50.8 feet to intersection with westerly side line of the Wizard placer claim, thence north along the westerly side line of the Wizard placer claim 57.4 feet to intersection with line 1-2 of said Wayne lode claim, thence south 62 degrees 08 minutes east 26.8 feet to corner No. 2 of said Wayne lode claim and being the place of beginning. Said conflict area containing 0.016 acres.

(e) Beginning at the point of intersection of line 7-8 of said so-called Wayne lode claim with the westerly side line of the Wizard placer claim, said point of intersection being south 52 degrees 54 min-

utes east 274.5 feet from corner No. 8 of said Wayne lode claim, which said corner No. 8 is south 27 degrees 52 minutes west 425 feet from corner No. 1 of said Wayne lode claim, whence the 1/4 section corner on the south boundary of section 31, township 12 south, range 45 east, Boise base and meridian, bears north 3 degrees 17 minutes west 5503.9 feet; thence running from said point of intersection aforesaid north along the westerly side line of the Wizard placer claim 62.6 feet to intersection of line 3-4 of said Wayne lode claim with the westerly side line of the said Wizard placer claim, thence south 52 degrees 54 minutes east 236.2 feet to corner No. 4 of said Wayne lode claim, thence south 12 degrees 57 minutes east 519.1 feet to intersection of line 4-5 of said Wayne lode claim with south line of said Wizard placer claim, thence south 89 degrees 51 minutes west along said south line of said Wizard placer claim 51.2 to intersection of line 6-7 of said Wayne lode claim with south line of said Wizard placer claim, thence north 12 degrees 57 minutes west 489.6 feet to corner No. 7 of said Wayne lode claim; thence north 52 degrees 54 minutes west 180.5 feet to the place of beginning. Said conflict area containing 0.817 acres.

It is further Ordered, Adjudged and Decreed that the [921] said San Francisco Chemical Company is such owner and entitled to recover said premises of and from the said Morse S. Duffield and Lewis A. Jeffs by virtue of full compliance with the statutes of the United States and the State of Idaho in the discovery and location of said "Wilmington," "Col-



cock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and Wizard placer mining claims, and that all adverse claims of the said complainants, Morse S. Duffield and Lewis A. Jeffs, and each of them, and all persons claiming or to claim said premises, or any part thereof through or under said complainants, or either of them, are hereby adjudged and decreed to be invalid and groundless and the title of the said San Francisco Chemical Company to said placer mining claims and each of them, and particularly the conflict area heretofore described, is adjudged to be quieted against all claims, demands or pretensions of the said complainants, Morse S. Duffield and Lewis A. Jeffs, or either of them, who are hereby perpetually estopped and enjoined from setting up any claims thereto, or to any part thereof.

It is further Ordered, Adjudged and Decreed, that the said defendant, San Francisco Chemical Company, have and recover of and from the complainants, Morse S. Duffield and Lewis A. Jeffs, its costs herein taxed at Two Hundred Thirty-nine & 68/100 Dollars (\$239.68).

WM. C. VAN FLEET,  
U. S. District Judge.

[Endorsed]: Filed Sept. 16, 1912. A. L. Richardson, Clerk. [922]



*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,  
Defendant.

**Petition for Appeal.**

The above-named complainants, Morse S. Duffield and Lewis A. Jeffs, believing themselves aggrieved by the order, judgment and decree entered on the 16th day of September, A. D. 1912, in the above-entitled cause, do hereby appeal from said order, judgment and decree to the United States Circuit Court of Appeals in and for the Ninth Circuit, for the reasons specified in the Assignment of Errors filed herein, and pray that this, their appeal, may be allowed and that a transcript of the record, proceedings and papers upon which said order, judgment and decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals in and for the Ninth Circuit.

A. B. GOUGH,  
C. B. JACK and  
CHARLES C. DEY,

Solicitors for Complainants and Appellants, Morse  
S. Duffield and Lewis A. Jeffs.

And now, to wit, the 1st day of November, A. D. 1912, it is ordered that the appeal be allowed as prayed for.

FRANK S. DIETRICH,

District Judge for the District of Idaho.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [923]

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*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,  
Defendant.

**Assignment of Errors.**

Come now the complainants above named and file the following Assignment of Errors upon which they will rely upon their appeal from the decree made by this Honorable Court on the 16th day of September, A. D. 1912, in the above-entitled cause, and said complainants say that the said decree in said cause is erroneous and against the just rights of said complainants for the following reasons:

I.

Because the evidence showed that within the exterior boundaries of defendant's alleged placer mining claims, to wit, "Wilmington," "Colcock,"

“Inman,” “Winfield,” “Winter,” “Wonder,” “Winslow,” and “Wizard,” and each of them respectively, the only valuable mineral deposit therein contained is a solid body of [924] mineral found in place in the mass of the mountain within clearly defined walls of a characteristic weight, color and texture, and has a definite dip and strike, and therefore the Court erred in decreeing the defendant to be the owner and entitled to the possession and occupancy of said alleged placer mining claims and each of them, and in not dismissing the cross-bill of complaint of the defendant, and adjudging that said alleged placer mining claims and each of them were and are invalid.

## II.

Because the evidence showed that neither the defendant nor its predecessor in interest had initiated or maintained its said placer locations, to wit, “Wilmington,” “Colcock,” “Inman,” “Winfield,” “Winter,” “Wonder,” “Winslow,” and “Wizard,” or either or any of them, in compliance with the laws of the United States or the local regulations of the State of Idaho, in that the evidence showed that the ground covered by defendant’s said placer locations and each of them, and the ground included within the complainants’ lode locations, to wit, “Obey,” “Obed,” “Jimtown,” “Fentress,” “Cumberland,” “Overton,” “Mt. Pleasant,” “Arkansas,” “Hickman,” “Columbia,” and “Wayne,” and each of them, including the conflict area between said lode and said placer locations was not subject to location, acquisition and purchase by means of placer loca-

tions, but only by lode locations; that the valuable mineral deposit contained within defendant's said alleged placer mining locations and upon which such locations and each of them are solely based, is the one and only valuable mineral deposit therein contained and is the identical mineral deposit sought to be secured by the complainants by virtue of their said lode locations; that said valuable deposit is a solid body of mineral found in place within the [925] mass of the mountain between clearly defined walls of a characteristic weight, color and texture, with definite dip and strike and continuity on dip and strike, and not otherwise; and, therefore, the Court erred in decreeing and holding that the defendant is the owner and entitled to the possession and occupancy of the area described in the decree in conflict between said defendant's placer locations and complainants' said lode locations by virtue of the compliance with the laws of the United States or of the State of Idaho, or otherwise, and in adjudging and decreeing the adverse claim of complainants based upon their said lode locations to the extent of the conflict area between said lode and said placer locations to be invalid or groundless, and in quieting the defendant's alleged title to said conflict area.

### III.

Because the evidence showed that the complainants had lawfully initiated and maintained their several lode locations, to wit, "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman,"

“Columbia,” and “Wayne,” and each of them respectively, by full compliance with the laws of the United States and the local regulations of the State of Idaho; that the respective parties to this action are each claiming respectively identically the same mineral deposit, the complainants by virtue of lode locations and the defendants by virtue of placer locations; that in the ground covered by such locations respectively, including the area in conflict, the valuable deposit consists of a solid mass of mineral found in place within clearly defined walls of a characteristic weight, color and texture, in the mass of the mountain with definite dip and strike and continuity on dip and strike, and contains no other valuable mineral deposit; and, therefore, [926] the Court erred in not adjudging and decreeing that all of complainants’ lode locations and each of them respectively were valid, and that complainants were the owners and entitled to the possession of the conflict area with defendant’s said placer locations, as prayed for in their amended bill of complaint herein and described therein and in said decree.

WHEREFORE, complainants pray that said decree be reversed and that the said Court may be directed to enter a decree in accordance with the prayer of complainants’ amended bill of complaint herein.

A. B. GOUGH,  
C. B. JACK,  
CHARLES C. DEY,  
Solicitors for Complainants.



[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [927]

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*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY,  
Defendant.

**Order Allowing Petition on Appeal.**

At this date come the complainants, by their solicitors, A. B. Gough, C. B. Jack and Charles C. Dey, and file and present to the Court its petition for the allowance of an appeal intended to be urged by them to the United States Circuit Court of Appeals for the Ninth Circuit, together with their Assignment of Errors and a Bond in the sum of \$500.00, conditioned according to law, and pray that their appeal may be allowed and that a transcript of the record, proceedings and papers upon which said order, judgment and decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals in and for the Ninth Circuit.

On consideration whereof, it is ordered by the Court that said appeal be allowed and said bond approved and it is further ordered that said bond shall

operate as a supersedeas bond.

Dated November 1st, 1912.

FRANK S. DIETRICH,  
Judge of the United States District Court in and  
for the District of Idaho.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson,  
Clerk. [928]

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*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,

Defendant.

**Bond on Appeal.**

KNOW ALL MEN BY THESE PRESENTS:  
That we, Morse S. Duffield and Lewis A. Jeffs, and  
National Surety Company, a corporation duly exist-  
ing under and by virtue of the laws of the State of  
New York and doing business within the State of  
Idaho, are held and firmly bound unto the above-  
named defendant, San Francisco Chemical Com-  
pany, in the full and just sum of Five Hundred Dol-  
lars, to be paid to said defendant, San Francisco  
Chemical Company, its successors or assigns, to  
which payment well and truly to be made we bind  
ourselves, our heirs, executors and administrators,  
successors or assigns, jointly and severally by these

presents. Sealed with our seals and dated this 31st day of October, in the year of our Lord one thousand nine hundred and twelve.

WHEREAS, lately at the September term of said District Court of the United States in and for the District of Idaho, in a suit depending in said court between Morse S. Duffield and Lewis A. Jeffs, complainants, and San Francisco Chemical Company, [929] defendant, a decree was rendered against the said complainants, and the said complainants have obtained an appeal of the said Court to reverse the said decree in the aforesaid suit, and a citation directed to the said defendant citing and admonishing it to be and appear in the United States Circuit Court of Appeals for the Ninth Circuit, at the city of San Francisco, California, thirty days from and after the date of said citation.

NOW, the condition of the above obligation is such that if the said appellants shall prosecute said appeal to effect, and answer all damages and costs if they fail to make good their plea, then the above obligation to be void; else to remain in full force and virtue.

Sealed and delivered in presence of:

MORSE S. DUFFIELD. [Seal]

LEWIS A. JEFFS, [Seal]

By M. S. DUFFIELD,

His Agent.

NATIONAL SURETY COMPANY. [Seal]  
[Seal]

By CHARLES C. DEY,  
Resident Vice-President.

By J. B. MORETON,  
Resident Assistant Secretary.

Approved by:

FRANK S. DIETRICH,  
Judge of the United States District Court for the  
District of Idaho.

Nov. 1, 1912.

Countersigned at Boise, Idaho, by

ENSIGN & ENSIGN,  
General Agents. [930]

State of Utah,  
County of Salt Lake,—ss.

Personally appeared before me, a Notary Public in and for Salt Lake County, State of Utah, J. B. Moreton, who being first duly sworn on oath deposes and says: That he is Resident Assistant Secretary, and that Charles C. Dey is Resident Vice-President of the National Surety Company of New York, a corporation organized under the laws of the State of New York, and that they are duly authorized to execute and deliver the foregoing obligation; that the said National Surety Company of New York is authorized to execute the same, and has complied with all the laws of the State of Utah in reference to becoming sole surety upon bonds, undertakings and obligations. Affiant further says that J. B. Moreton, whose address is Salt Lake City, Utah, has been appointed as attorney upon whom process for the State of Utah may be served according to law.

J. B. MORETON.

Subscribed and sworn to before me this 31st day of October, A. D. 1912.

[Seal]

R. E. MARK,  
Notary Public.

My commission expires April 5th, 1915.

[Endorsed]: Filed Nov. 1, 1912. A. L. Richardson, Clerk. [931]

*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,

Defendant.

**Stipulation in Re Transcript and Exhibits.**

It is hereby stipulated by and between the complainants by their attorneys and the defendant, by its attorneys, that the transcript of the record on the appeal in the above-entitled cause shall be made up of the following papers:

Amended Bill of Complaint; Exhibits "A" and "B" to the original Bill of Complaint; Answer and Cross-complaint of Defendant; Replication of Complainants; Complainants' Answer to Cross-bill of Defendant; Replication to Answer to Cross-bill; all original exhibits admitted in evidence on the part of the complainants and defendant, including the Registrar's final certificate of entry for the Windward Placer Mining Claim, and the certified copy of letter addressed to Registrar & Receiver, Blackfoot, Idaho, by Assistant Commissioner Proudfit of the General Land Office under date of July 8, 1911, which were introduced at the final hearing of said cause on the 5th day of January, 1912, according to stipulation filed herein; Transcript of Testimony;



Stipulation for final hearing of cause before Hon. William [932] C. Van Fleet, Judge of the United States District Court for the Northern District of California, at San Francisco, California; the Opinion of the Court rendered in said cause; Final Decree; Petition for Appeal and Allowance thereof; Assignment of Errors; Bond; Citation and acknowledgment of service; and this Stipulation and order thereon.

Dated, November Sixth, A. D. 1912.

A. B. GOUGH,  
C. B. JACK and  
CHARLES C. DEY,  
Attorneys for Complainants.  
CLARK & BUDGE,  
Attorneys for Defendant.

[Endorsed]: Filed Nov. 9, 1912. A. L. Richardson, Clerk. [933]

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*In the District Court of the United States in and for  
the District of Idaho, Southern Division.*

No. 142.

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Complainants,

vs.

SAN FRANCISCO CHEMICAL COMPANY, a  
Corporation,

Defendant,

**Order to Forward Original Exhibits.**

**ORDER RE EXHIBITS AND MAPS.**

Pursuant to the stipulation of the attorneys for

the respective parties herein, dated November 6th, 1912, and on motion of complainants' attorneys,

IT IS HEREBY ORDERED that the originals of all exhibits and maps referred to in said stipulation in lieu of copies may and shall be certified to the Clerk of the United States Circuit Court of Appeals for the Ninth Circuit on return to the appeal herein.

Dated November 9th, 1912.

FRANK S. DIETRICH,  
Judge of the United States District Court for the  
District of Idaho.

[Endorsed]: Filed, Nov. 9, 1912. A. L. Richardson, Clerk. [934]

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**Citation.**

UNITED STATES OF AMERICA,—ss.

To San Francisco Chemical Company, a Corporation, Greeting:

You are hereby cited and admonished to be and appear in the United States Circuit Court of Appeals for the Ninth Circuit, at the city of San Francisco, California, thirty days from and after the day this citation bears date, pursuant to an appeal allowed and filed in the Clerk's office of the District Court of the United States for the District of Idaho, wherein Morse S. Duffield and Lewis A. Jeffs are appellants and you are appellee, to show cause, if any there be, why the decree rendered against the said appellants as in said appeal mentioned should not be corrected and why speedy justice should not be done the parties in that behalf.

WITNESS the Honorable FRANK S. DIE-

TRICH, Judge of the United States District Court for the District of Idaho, this 1st day of November, A. D. 1912.

FRANK S. DIETRICH,  
Judge of the United States District Court for the District of Idaho.

[Seal]      Attest: A. L. RICHARDSON,  
Clerk.

I hereby, this 5th day of November, A. D. 1912, accept due personal service of this citation on behalf of the above-named appellee.

CLARK & BUDGE,  
Solicitors for Appellee. [935]

[Endorsed]: No. 142. In the District Court of the United States for the District of Idaho, Eastern Division. Morse S. Duffield and Lewis A. Jeffs, Plaintiffs, vs. San Francisco Chemical Company, a Corporation, Defendant. Citation. Filed Nov. 6, 1912, on Return. A. L. Richardson, Clerk. By E. B. Yarrington, Deputy Clerk. [936]

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**Return to Record.**

And thereupon it is ordered by the Court that a transcript of the record and proceedings in the cause aforesaid, together with all things thereunto relating, be transmitted to the said United States Circuit Court of Appeals for the Ninth Circuit, and the same is transmitted accordingly.

[Seal]      Attest: A. L. RICHARDSON,  
Clerk.

By E. B. Yarrington,  
Deputy Clerk. [937]

*In the District Court of the United States, District of  
Idaho.*

MORSE S. DUFFIELD and LEWIS A. JEFFS,  
Appellants,

vs.

SAN FRANCISCO CHEMICAL COMPANY,  
Appellee.

**Certificate [of Clerk U. S. District Court to Record,  
etc.]**

I, A. L. Richardson, Clerk of the District Court of the United States for the District of Idaho, do hereby certify that the above and foregoing transcript of pages, from 1 to 938, inclusive, contain true and correct copies of the Amended Bill of Complaint, Answer and Cross-Complaint, Answer to Cross-Bill of San Francisco Chemical Company, Replication, Replication to Answer to Cross-Bill, Stipulation, Testimony, Opinion on Final Hearing, Decree, Petition for Appeal, Bond on Appeal, Stipulation in re Transcript and Exhibits, Order to Forward Original Exhibits, Citation, Return to Record and Clerk's Certificate to Transcript in the above-entitled cause, which together constitute the transcript of the record herein upon appeal to the United States Circuit Court of Appeals for the Ninth Circuit.

I further certify that the cost of the record herein amounts to the sum of \$558.00, and that the same has been paid by the appellants.

Witness my hand and the seal of said Court affixed  
this 21st day of November, 1912.

[Seal]

A. L. RICHARDSON,

Clerk.

By E. B. Yarrington,

Deputy Clerk. [938]

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[Endorsed]: No. 2203. United States Circuit  
Court of Appeals for the Ninth Circuit. Morse S.  
Duffield and Lewis A. Jeffs, Appellants, vs. San  
Francisco Chemical Company, a Corporation, Appel-  
lee. Transcript of Record. Upon Appeal from the  
United States District Court for the District of  
Idaho, Southern Division.

Filed November 29, 1912.

F. D. MONCKTON,

Clerk of the United States Circuit Court of Appeals  
for the Ninth Circuit.



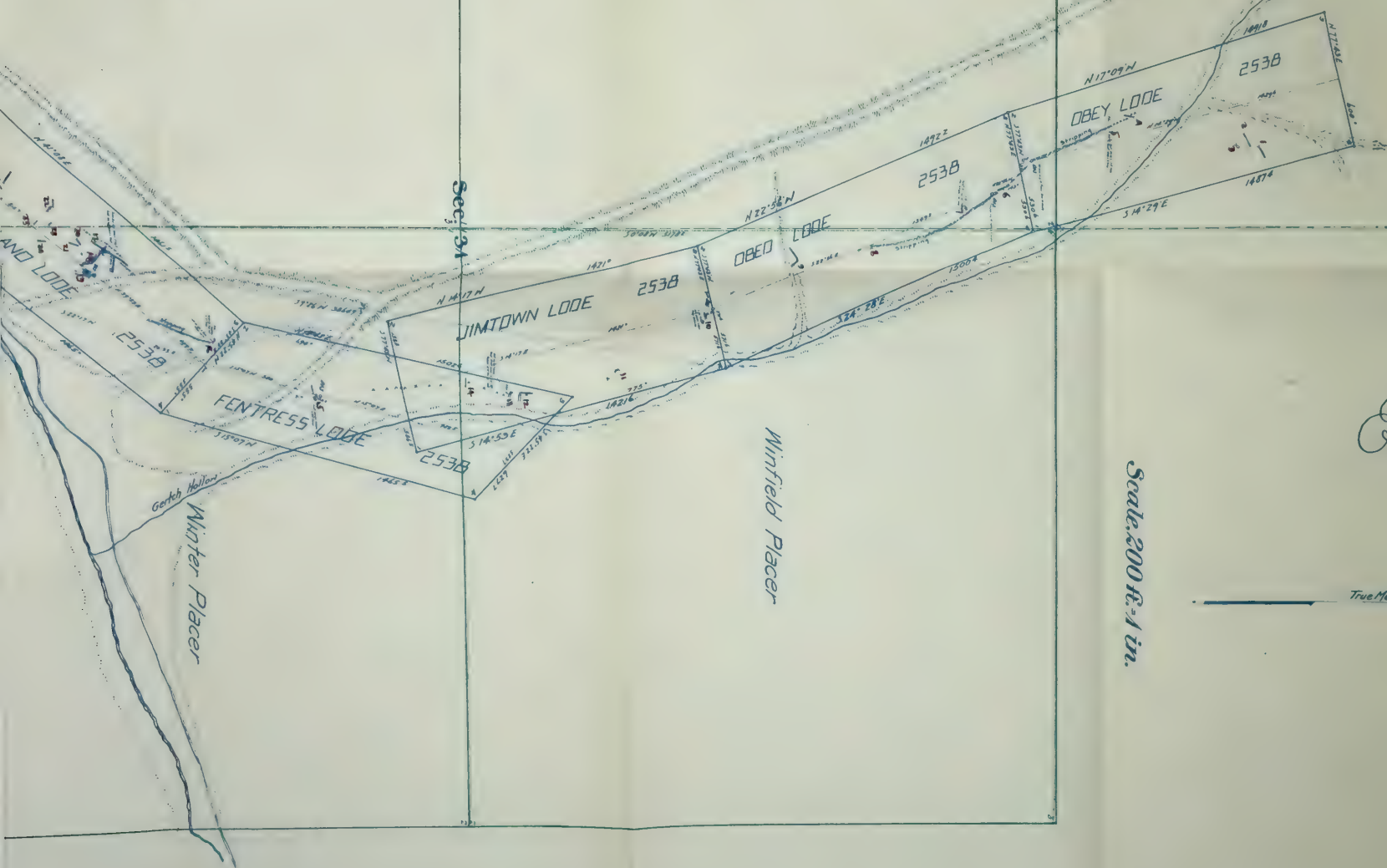
3

*True Meridian*

Winfield Placer

Winter Placer

*Scale. 200 ft. = 1 in.*



T.12S., R.45E. Boise B & M  
T.13S., R.45E.

Winslow Placer

Wood

Montezuma Canon Creek

OVERTON LODE

MT. PLEASANT LODE

TENNESSEE LODE

ARKANSAS LODE

Waterloo Placer

MAURY LODE

COLUMBIA LODE

Wizard Placer

HICKMAN LODE

Sec. 6

U.S. GEOLOGICAL SURVEY  
PLANTING EXHIBIT  
F.O. MONTGOMERY (1905)

WAYNE

Sec. 7

Colcock Placer

Inman Placer

Wonder Placer

Section of A-B

CASE No 2203  
U.S. CIRCUIT COURT OF APPEALS  
FOR THE NINTH CIRCUIT  
DEFENDANTS EXHIBIT 2  
Received Dec 2 1912  
R.D. MONCKTON, Clerk

Sec. 30

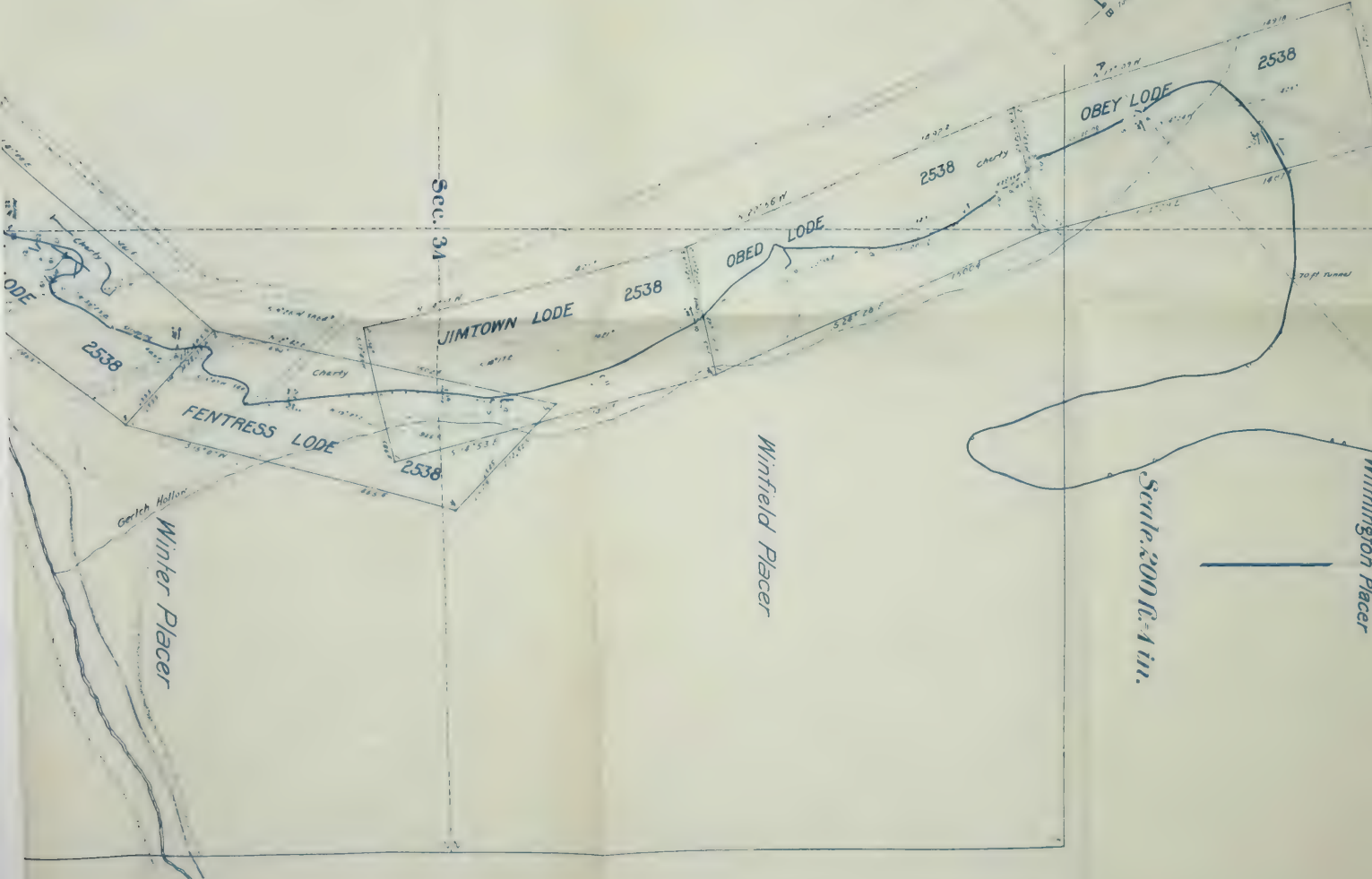
Sec. 34

Scale 200 ft. = 1 in.

Wilmington Placer

Winfield Placer

Winter Placer



LEGEND  
↑ indicates dip of main phosphate bed  
Heavy black line indicates position of main  
phosphate bed as shown by contour, open circle and  
natural exposures

Defendants Exhibit 2



T.12S., R.45E. Boise B&M  
T.13S., R.45E.

Winslow Placer

Road

Manzanita Canyon Creek

OVERTON LODE

MT. PLEASANT LODE

CUMBERLAND

Waterloo Placer

Wizard Placer

ARKANSAS LODE

KANSAS LODE

HICKMAN LODE

COLUMBIA LODE

MAURY LODE

WAYNE

See B

Section on C-D

Sec. 7

No. 2203

United States  
Circuit Court of Appeals  
For the Ninth Circuit

Brief of Appellants

MORSE S. DUFFIELD and  
LEWIS A. JEFFS,  
Appellants,

vs.

SAN FRANCISCO CHEMI-  
CAL COMPANY, a corpor-  
ation,  
Appellee.

Upon Appeal from the United States District Court for  
the District of Idaho, Southern Division.

A. B. Gough,  
A. L. Hoppaugh,  
C. B. Jack, and  
Charles C. Dey,  
Counsel for Appellants.

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JAN 28 1912





No. 2203

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Circuit Court of Appeals  
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Brief of Appellants

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CAL COMPANY, a corpor-  
ation,

Appellee.

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Upon Appeal from the United States District Court for  
the District of Idaho, Southern Division.

## STATEMENT OF THE CASE.

This suit was brought pursuant to Sec. 2326, Rev. Stat. of the United States by the appellants (complainants) as owners and in possession of certain lode mining claims known as the "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia," and "Wayne," against the appellee (defendant) to quiet their title as to the conflict area with appellee's placer mining claims known as the "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard."

As to the "Wilmington" placer, no conflict area exists or is now claimed, having been expressly disclaimed in appellants' answer to appellee's cross-bill.

The appellee filed its application for patent on August 11th, 1910, in the United States Land Office at Blackfoot, Idaho.

On October 9th, 1910, during the period of publication, the appellants filed an adverse claim and this suit was brought in due time.

The cause is at issue upon the Amended Bill of Complaint, the Answer thereto, and Appellee's Cross-Bill and Answer thereto, with usual replications.

The facts requisite to establish the rights of the parties respectively to the conflict area have, by the pleadings, undisputed evidence and stipula-

tions of counsel been narrowed down to one controlling question, viz.:

Whether the one and only valuable mineral deposit existing within the exterior boundaries of the said placer and of the said lode locations, the deposit upon which the discovery for both the placer and lode locations respectively is based, can be secured under the Acts of Congress by means of a placer location or by means of a lode location. If it cannot be secured by means of a placer location, the further question may be pressed by appellee, viz.: Whether appellants lawfully initiated their said lode locations within the limits of said placer locations.

The facts substantially without dispute bearing upon those issues briefly stated are as follows:

## 1. LOCATIONS.

In the year 1901, Mr. Glenn and Mr. Brennan filed a coal land declaratory statement in the belief that the deposit was coal. They drove a tunnel, and subsequently, in 1903, sold out to the San Francisco Chemical Co. (Rec. 552-3.)

In 1904-5 the predecessors in interest of the San Francisco Chemical Co. made the placer locations covering this deposit, including the placer claims involved in this case. These claims were transferred to said company, the appellee, in August, 1906. (Rec. 505.)

Each of the placer claims of appellee involved herein comprises 160 acres except the "Winslow" and "Wizard," which have an area of 90.51 and 100.35 acres respectively. (Rec. 31-2, Plaintiff's Exhibit 1 and Defendant's Exhibit 2.)

In 1904, the same year the placer locations were made, one C. C. Jones made lode locations upon this deposit. (Rec. 240.) It does not appear whether the placer or lode locations were prior in time. Litigation followed to which we will hereafter refer. Mr. Jones, prior to any adjudication, abandoned the lode locations. (Rec. 501-2, 119, 156.) There were no lode claims in 1906. (Rec. 648.)

In 1907, Mr. Duffield, one of the appellants, who had since 1902 (Rec. 129) been interested in mines valuable for phosphate, was attracted to the locality of the ground in controversy by an article in the Engineering and Mining Journal by the said Mr. C. C. Jones. (Rec. 134.) Subsequently he looked up the county records, made a map (Rec. 136, 137, 151), and thereupon, with his co-appellant, Mr. Jeffs, in November, 1907, made the lode locations involved here, practically including the same ground as originally included in the old abandoned Jones lode locations. At the time the lode locations were made there was no one on the placer locations or any evidence of work in progress. (Rec. 119, 152-3.)



## 2. TOPOGRAPHY.

The claims are situated in the Pruess range of mountains, Bear Lake County, Idaho. These mountains trend northerly and southerly. Montpelier creek and canyon deploys southwesterly between the "Overton" and "Mt. Pleasant" lode claims. All the claims are located on steep and rolling ground. The surface slopes toward Montpelier canyon. The "Obey" is located on the highest ground, and the "Arkansas" and "Hickman" on lower ground.

## 3. MAPS.

In connection with the printed record, there are two maps reproduced, Plaintiffs' (Appellants') Exhibit 1, and Defendant's (Appellee's) Exhibit 2.

Plaintiffs' Exhibit 1 shows in green lines the boundaries of the placer locations and in black lines the boundaries of the lode locations. In addition to the locations involved in this controversy, the following additional placer locations are also shown, viz.: "Waterloo" and "Wilmington." Also additional lode locations, to wit: "<sup>Princess</sup>~~Hickman~~" and "Maury." Montpelier canyon creek and the prominent outcrops are shown. Black lines indicate tunnels, double or parallel lines indicate cuts. The top of the principal ridge is shown in brown ink, with

hatched lines. The gulches and roads are shown in brown in the conventional way. (Rec. 54-56.)

Defendant's Exhibit 2, was made by Mr. Weeks (leading expert and witness for appellee). It purports to be a duplicate of plaintiffs' Exhibit 1, with the addition of a heavy black line, which Mr. Weeks explains indicates position of main phosphate bed as shown by tunnels, open cuts and natural exposures which he says constitutes "a very natural outcrop." (Rec. 527-529.)

#### 4. CHARACTER OF THE VALUABLE MINERAL DEPOSIT.

The claims contain a valuable mineral deposit commonly known as calcium phosphate, or rock phosphate, and technically as a form of Apatite, called Phosphorite. The valuable mineral is tri-calcium phosphate, a union of calcium, phosphorus and oxygen,  $(\text{CaO})_3\text{P}_2\text{O}_5$  or  $\text{Ca}^3(\text{PO}_4)_2$  (Rec. 253, 431, 437, 438, see tables 695, 697).

Calcium is a metallic, while phosphorus is usually classified as a non-metallic element. (Rec. 438.)

The phosphorus in the ore gives to the deposit its commercial value. (Rec. 339, 253, 431, 404.)

## 5. CHARACTERISTICS OF THE PHOSPHATE DEPOSIT.

The geological formation is sedimentary. Within the ground covered by the placer and lode locations there is a mineral belt or zone of calcium phosphate. The mineralized zone is readily distinguishable from the enclosing wall rocks. It is distinctively different in color, texture and specific gravity. It extends through the ground included in said lode and placer locations from the northerly to the southerly boundaries thereof, and beyond. The dip and strike conform to the stratification of the sedimentary beds. (Rec. 176, 253-5, 274-7, 423-431, 475-6, 520, 762.)

In some places erosion has removed a portion of the hanging wall. Any apparent irregularity in dip and strike is due to the irregularity of the uplifting of the sedimentary beds. Gulches and gulleys cut through the deposit. Possibly rolls and folding of the beds on the strike and on the dip account for many minor irregularities. (Rec. 428, 429, 534.)

The course of the strike of the mineralized zone is northerly and southerly. The dip is westerly, varying from 15 to 45 degrees. The average dip is approximately thirty-five degrees. (Rec. 420-432, 257-278.) The width or thickness of the mineralized zone, where it could be determined, is at least sixty feet. (Rec. 276, 418, 424.)

This mineralized zone is in place in the solid mass of the mountains. It is between clearly defined walls. The overhanging wall is a cherty siliceous limestone, usually bluish in color. The foot wall is also limestone, but usually less siliceous, color generally grayish. (Rec. 429, 430, 253-4.)

The discoveries for the lode and placer locations were made upon this deposit. (Rec. 479-480.) The lower bed of phosphate is the one now of commercial value. (Rec. 385-6, 482, 735.) The lode locations follow closely the outcrop of the lower phosphate bed. (Rec. 570.)

This phosphate deposit, with its foot and hanging walls, is exposed in many places on the surface; and can be readily traced thereon. (Rec. 529, 805-7.)

Within the walls, bounding this mineral deposit, are found alternating beds of calcium phosphate, shale and limestone. The intervening beds of shale and limestone also contain phosphorus, which is proven by chemical analysis. (Rec. 431, 251-3, 520-1.) The beds of phosphate and alternating beds of shale and limestone are of varying thickness and richness. The individual beds of phosphate vary in thickness from five feet to a few inches. The color of the phosphate is black, the deposit having somewhat the appearance of coal, but not the texture, and a much greater specific gravity. (762-3.) The position of the apex or outcrop of this deposit is visible at many points along the surface, and by which it can be traced throughout the ground

covered by the placer and lode locations. This deposit, in the form stated, is the only mineral deposit known to exist in the ground included within the exterior boundaries of the several placer and lode locations. (Rec. 470-473, 479.)

The characteristics noted are in general similar where this deposit or mineralized zone has been found in other parts of Wyoming, Southeastern Idaho and Northeastern Utah.

## 6. THE LODE LOCATIONS.

These locations are laid to cover the mineralized zone on its course at its outcrop or apex. The Mt. Pleasant location is made on the outcrop of the vein caused by the erosion which made Montpelier Canyon. From this claim the vein rises and outcrops again on the Arkansas lode claim, making the true apex of the vein or lode in this latter claim. (Rec. 799, 539.)

## 7. EXPLORATION AND MINING DEVELOPMENTS.

Numerous tunnels have been driven in on the deposit as shown on Exhibit 1, also much stripping, to expose the deposit at the surface. All the workings on the claims involved in this cause, shown on Exhibit 1, were made prior to defendant's applica-



tion for patent. The surface and underground workings clearly disclose the form and character of the deposit, its walls, its strike, its dip, its continuity on dip and strike, and its contents to be as heretofore stated.

## 8. MINING, TREATMENT AND USES.

The deposit is mined by blasting and other methods, the same as coal, ore and minerals are generally mined. It is transported to mills for reduction and treatment; and the product is now used chiefly as a fertilizer. Phosphorus is also used in the arts and industries. Phosphor-bronze metal is extensively used for special purposes. In the manufacture of certain kinds of matches, it has a valuable application. Phosphorus compounds are used also in *Materia Medica*. (Rec. 255, 466, 337, 546.)

## SPECIFICATIONS OF ERRORS RELIED UPON.

1. Because the evidence showed that within the exterior boundaries of defendant's alleged placer mining claims, to wit: "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," and each of them respectively, the only valuable mineral deposit therein contained

is a solid body of mineral found in place in the mass of the mountain within clearly defined walls of a characteristic weight, color and texture, and has a definite dip and strike, and therefore the court erred in decreeing the defendant to be the owner and entitled to the possession and occupancy of said alleged placer mining claims and each of them, and in not dismissing the cross-bill of complaint of the defendant and adjudging that said alleged placer mining claims and each of them were and are invalid.

2. Because the evidence showed that neither the defendant nor its predecessor in interest had initiated or maintained its said placer locations, to wit: "Wilmington," "Colcock," "Inman," "Winfield," "Winter," "Wonder," "Winslow," and "Wizard," or either or any of them, in compliance with the laws of the United States or the local regulations of the State of Idaho, in that the evidence showed that the ground covered by defendant's said placer locations and each of them, and the ground included within the complainants' lode locations, to wit: "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia," and "Wayne," and each of them, including the conflict area between said lode and said placer locations was not subject to location, acquisition and purchase by means of placer locations, but only by lode locations; that the valuable mineral deposit contained within defendant's said alleged placer mining locations and

upon which such locations and each of them are solely based, is the one and only valuable mineral deposit therein contained and is the identical mineral deposit sought to be secured by the complainants by virtue of their said lode locations; that said valuable deposit is a solid body of mineral found in place within the mass of the mountain between clearly defined walls of a characteristic weight, color and texture, with definite dip and strike and continuity on dip and strike, and not otherwise; and, therefore, the court erred in decreeing and holding that the defendant is the owner and entitled to the possession and occupancy of the area described in the decree in conflict between said defendant's placer locations and complainants' said lode locations by virtue of the compliance with the laws of the United States or of the State of Idaho, or otherwise, and in adjudging and decreeing the adverse claim of complainants based upon their said lode locations to the extent of the conflict area between said lode and said placer locations to be invalid or groundless, and in quieting the defendant's alleged title to said conflict area.

3. Because the evidence showed that the complainants had lawfully initiated and maintained their several lode locations, to wit: "Obey," "Obed," "Jimtown," "Fentress," "Cumberland," "Overton," "Mt. Pleasant," "Arkansas," "Hickman," "Columbia," and "Wayne," and each of them respectively, by full compliance with the laws of the United

States and the local regulations of the State of Idaho; that the respective parties to this action are each claiming respectively identically the same mineral deposit, the complainants by virtue of lode locations and the defendants by virtue of placer locations; that in the ground covered by such locations respectively, including the area in conflict, the valuable deposit consists of a solid mass of mineral found in place within clearly defined walls of a characteristic weight, color and texture, in the mass of the mountain with definite dip and strike and continuity on dip and strike, and contains no other valuable mineral deposit; and, therefore, the court erred in not adjudging and decreeing that all of complainants' lode locations and each of them respectively were valid and that complainants were the owners and entitled to the possession of the conflict area with defendant's said placer locations, as prayed for in their amended bill of complaint herein and described therein and in said decree.

### ARGUMENT.

It should be borne in mind that this case does not involve the question of a lode within a valid placer location, for which provision is made by Sec. 2333 Rev. Stat. It is undisputed and conceded that there is but the one individual mineral deposit contained within the exterior boundaries of the

several placer and lode locations. Each party is respectively seeking to acquire the same identical mineral deposit, appellee by means of prior placer locations, appellant by means of subsequent lode locations. This one continuous mineral deposit on its course longitudinally is the sole basis to support the respective discoveries, locations and claims to the exclusive right of possession. If the deposit is a vein or lode coming within the purview of Sec. 2320, Rev. Stat., then in any event the placer locations are void—the judgment in favor of appellee is erroneous; and the lode locations, if peaceably made, are valid and the appellants were and are entitled to be awarded herein the ground in controversy.

That issue, viz.: As to the form in which the mineral appears, whether in placers or in lodes or veins, is directly and clearly tendered by the Bill of Complaint and Answer thereto, also by the Cross-Bill and Answer thereto. See Amended Bill of Complaint, paragraph X (Rec. 18-21), and Answer thereto, paragraph X (Rec. 27-29), also Cross-Bill of Complaint, paragraph IX (Rec. 35), and Answer thereto, paragraph 8 (Rec. 44-45).

The controlling question in this case, the sole ground upon which the validity of the placer locations is challenged, is whether the valuable mineral deposit contained within the ground in controversy is a vein or lode as defined by Sec. 2320, Rev. Stat. If the deposit is such a vein or lode, the remaining question is whether the lode locations were peaceably



initiated within the boundaries of the void placer locations.

Following the line of argument of counsel for defendant (appellee herein) the Judge of the District Court held that the underlying question in issue was one not within the province of the court to pass upon and determine, but one exclusively for the determination of the Land Department. (198 Fed., 942.)

In anticipation of that argument here and in view of that decision, four questions are presented, which, for convenience in presentation and to avoid unnecessary repetition, we arrange in the following order: (1) Whether a lode or vein, particularly a non-metalliferous lode or vein, can be secured by means of a placer location? (2) Is it the duty and within the province and jurisdiction of the court in this action, brought in support of an adverse claim pursuant to the provisions of Sec. 2326, Rev. Stat., to determine whether or not the mineral deposit (the sole basis for discovery and location by the placer and lode claimants respectively), is a vein or lode as contemplated by Sec. 2320, Rev. Stat.? (3) Did the lode claimants (the appellants) lawfully initiate their lode locations thereon within the boundaries of the placer locations of appellee? (4) Is the mineral deposit a lode or vein within the purview of Sec. 2320, Rev. Stat.?

All these four questions have recently been decided by the Circuit Court of Appeals, Eighth Circuit (Nov. 21, 1912) in favor of the subsequent

lode claimant and against the prior placer claimant in an adverse case between the same parties as here and involving the same questions, and similar mineral deposit. The evidence being identical in that and in this case, in reference to the form and character of the mineral deposit.

San Francisco Chem. Co. vs. Morse S. Duffield, et al, ——Fed.—— (Not as yet reported.)

# I.

A PLACER LOCATION MADE TO SECURE A VEIN OR LODE IN PLACE CONTAINING A VALUABLE METALLIFEROUS OR NON-METALLIFEROUS MINERAL DEPOSIT, IS WHOLLY NUGATORY AND VOID.

First. **Non-metallic minerals are included within the provisions of Sec. 2320, Rev. Stat.**

That section reads in part:

“Mining claims upon veins or lodes of quartz or other rock in place bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits,” etc.

That this ore is non-metalliferous, or should be so classed, there is grave doubt. At the present time it is not popularly regarded as metallic, though

partly composed of a metal (calcium). Phosphorus as metallic is not unknown (see Vol. 17, Enc. Britanica, p. 815, 817).

Independent of that question, however, the proper construction of the words "or other valuable deposits" found in Sec. 2320 in connection with the whole mining act, removes any distinction between metallic or non-metallic deposits in determining the question whether a given deposit is a lode or vein.

Non-metallic minerals are minerals coming within the contemplation of the words "or other valuable deposits," found in Section 2320.

Webb vs. American Asph. Min. Co., 157  
Fed., 203; 84 C. C. A., 651;

Pac. Coast Marble Co. vs. Nor. Pac. R. R.  
Co., 25 L. D., 233;

See also N. P. Ry. Co. vs. Soderberg, 188  
U. S., 526, 534-537.

The reasoning of the foregoing cases is so clear and convincing that all room for doubt upon the question is removed.

In 1st Lindley on Mines (2d Ed.) Sec. 323, the learned author treats this question: At page 584 he says:

"The act itself in terms makes no distinction based upon the chemical composition of the deposit. But it groups the classes according to the FORM in which the valuable deposits occur. In our judgment, there is no more

reason for insisting that veins or lodes of mica, graphite, asphaltum, gilsonite, or other non-metallic substance in place should be located as placers than it has to require cinnabar deposits to be located as lodes, independently of the form of their occurrence."

and again in conclusion, page 588:

"it follows, in our judgment, that land containing any substance, metallic or non-metallic, which possesses economic value for use in trade, manufacture, the sciences, or in the mechanical or ornamental arts, if such substance exists therein in veins or lodes OF ROCK IN PLACE in sufficient quantities to render the land more valuable for the purpose of removing and marketing the product than for any other purpose, such land must be appropriated under the laws applicable to lodes.

"This may be contrary to the popular notion. But if there is any logic in the law, it seems to us that there is but one conclusion to be deduced, and that is the one we have adopted."

**Second. The placer locations are void. A vein or lode cannot be secured by means of a placer location.**

Webb vs. American Asphaltum Min. Co.,  
157 Fed., 203; 84 C. C. A., 621;

San Francisco Chem. Co. vs. Duffield, et al,  
 supra (C. C. A., 8th Cir.); —Fed.—;  
 United States vs. Iron Silver Min. Co., 128  
 U. S., 673, 675-6;  
 Bevis vs. Markland, 130 Fed., 226, 227;  
 Buffalo Z. & C. Co. vs. Crump, 69 S. W.,  
 572, 573;  
 Mutchmor vs. McCarty, 149 Cal., 603, 610;  
 Grosfield vs. Nigger Hill C. Min. Co., 14  
 Land Dec., 685;  
 1st Lindley on Mines (2d Ed.), Secs. 419,  
 323, 298;  
 Re E. M. Palmer, 38 Land Dec., 294, 296.

In *United States vs. Iron Silver Min. Co.*, supra, a suit to obtain a cancellation of two patents for alleged placer mining claims claimed to have been obtained by fraudulent representations that the land embraced by them was placer mining ground and contained no veins or lodes, Mr. Justice Field says (p. 675-6):

“It is the policy of the government to favor the development of mines of gold and silver and other metals, and every facility is afforded for that purpose; but it exacts a faithful compliance with the conditions required. There must be a discovery of the mineral, and a sufficient exploration of the ground to show this fact beyond question. The form also in which the mineral appears, whether in placers or in veins, lodes or ledges, must be disclosed



so far as ascertained. Misrepresentation knowingly made as to these matters by the applicant for a patent will afterwards justify the government in proceeding to set it aside."

Again (p. 680):

"What is important here is, that the amount of land which may be taken up as a placer claim and the amount as a lode claim, and the price per acre to be paid to the government in the two cases when patents are obtained, are different. And the rights conferred by the respective patents, and the conditions upon which they are held, are also different. Rev. Stat., Secs. 2320, 2322, 2325, 2333; *Smelting Co. vs. Kemp*, 104 U. S., 636, 651; *Iron Silver Min. Co. vs. Reynolds*, 124 U. S., 374."

In *Webb vs. American Asphaltum Min. Co.*, supra, an adverse suit in which the question presented was (p. 204):

"May the right to the possession and to the title to a vein or lode of asphaltum in rock in place be secured by the location of a placer claim upon the land in which it is found?"

Sanborn, C. J., after reviewing the Congressional Acts, sums up for the court as follows (p. 205-6):

"Thus it clearly appears that the plan of this legislation was to provide two general methods of purchasing mineral deposits from the United States—one by lode mining claims,

where the valuable deposits sought were in lodes or veins in rock in place, and the other by placer mining claims where the deposits were not in veins or lodes in rock in place, but were loose, scattered, or disseminated upon or under the surface of the land. The test which Congress provided by this legislation to be applied to determine how these deposits should be secured was the form and character of the deposits. If they are in veins or lodes in rock in place, they may be located and purchased under this legislation by means of lode mining claims; if they are not in fissures in rock in place but are loose or scattered on or through the land, they may be located and bought by the use of placer mining claims. *Reynolds vs. Iron Silver Mining Co.*, 116 U. S., 687, 695, 6 Sup. Ct. 601, 29 L. Ed. 774; *Clipper Min. Co. vs. Eli Min. & Land Co.*, 194 U. S., 220, 228, 24 Sup. Ct. 632, 48 L. Ed. 944."

In *Mutchmor vs. McCarty*, *supra*, Beatty, C. J., in considering the question, says (p. 610):

"The Revised Statutes of the United States (Sec. 2019, et seq.) provide for the disposition alike of lodes or veins, and of placer deposits. The price of lode claims is five dollars per acre of the surface, while that of placer claims is only two dollars and fifty cents. It is, therefore, a fraud for a person cognizant

of the existence of a vein of apparent value to attempt to acquire the title by means of a placer location and patent."

In re E. M. Palmer, 38 Land Dec., 294, 296, *supra*, it is said (p. 296):

"The question as to the class to which a particular mineral deposit is to be referred is vital, and must be determined when arising in patent proceedings. The courts have had occasion to discuss this matter in numerous cases."

We do not apprehend that it will be seriously claimed that if the mineral deposit is a vein or lode "in place" it can nevertheless lawfully be acquired by means of a placer location. From the opinion of the District Court in this case, contained in the transcript and also published (198 Fed., 942), we assume it will be again claimed here that the court in this action, brought pursuant to Sec. 2326, Rev. Stat., has no jurisdiction to pass upon the question and determine whether or not the mineral deposit is a vein or lode in place. That the court's determination of that question would be abortive, being one, it is therein stated, exclusively confided to the Land Department to determine. With that question thus thrust aside (the other acts of location and of maintaining the same having been conceded), it was decided that the prior placer locations were

valid to the extent the court is authorized to ascertain and determine. Such, in effect, it appears was the opinion of the court below; and, notwithstanding that opinion, instead of dismissing this cause without prejudice, a decree was directed to be entered quieting the title of the defendant and appellee to the conflict area. A singular misunderstanding it would seem of the office and purpose of an adverse claim pursuant to Sec. 2325, Rev. Stat. and the jurisdiction and duties of the court in this action brought pursuant to Sec. 2326, Rev. Stat., in support thereof, and of the Land Department in respect thereto.

## II.

IT IS BEYOND QUESTION WITHIN THE PROVINCE AND JURISDICTION AND THE PLAIN DUTY OF THE COURT IN THIS ACTION, IN SUPPORT OF AN ADVERSE CLAIM, TO PASS UPON AND DETERMINE WHETHER THE MINERAL DEPOSIT IN THE LAND IN CONTROVERSY AND WITHIN THE PLACER LOCATIONS IS A LODGE OR VEIN WITHIN THE PROVISIONS OF SEC. 2320, REV. STAT., FOR THE RIGHT OF POSSESSION AND PREFERENCE RIGHT TO A PATENT IS CLEARLY DEPENDENT THEREON; AND THE COURT'S DETERMINATION OF THAT QUESTION IS BY THE ACT OF CONGRESS MADE BINDING ON THE LAND DE-

PARTMENT IN FUTURE PROCEEDINGS  
UPON THE PENDING APPLICATION FOR  
PATENT.

The question of the purpose, scope and controlling effect of a suit under Sec. 2326, Rev. Stat., in support of an adverse claim, is well understood by this court. Yet, owing to the opinion and decision of the court below, we feel compelled to present this familiar phase of the case.

The method prescribed by Congress for obtaining a patent to mining claims is different from any other class of public lands, in that all adverse claims between mineral claimants are relegated to the local courts in the exercise of their general jurisdiction to deal with possessory rights. A statutory exception to the exclusive jurisdiction of the Land Department is created.

This is obvious by consideration of the scheme presented by the Acts of Congress and by the repeated, uniform decisions of the Supreme Court of the United States and also by the Land Department. As said by the court in *Blackburn vs. Portland Gold Min. Co.*, 175 U. S., 571, 586-7:

“It should not be overlooked that Sections 2325 and 2326 form a part of a general scheme in reference to the mineral lands of the United States. That scheme is contained in Chapter 6 of the Revised Statutes of the United States, and includes Sections from 2318 to 2352.”



Section 2326 provides:

“Where an adverse claim is filed \* \* \* all proceedings except the publication of the notice and filing of the affidavit thereof, shall be stayed until the controversy shall have been settled or decided by a court of competent jurisdiction, or the adverse claim waived. It shall be the duty of the adverse claimant, \* \* \* to commence proceedings in a court of competent jurisdiction, to determine the question of the right of possession, \* \* \* After such judgment shall have been rendered, the party entitled to the possession of the claim, or any portion thereof, may, without giving further notice, file a certified copy of the judgment-roll, etc., \* \* and a patent shall issue thereon for the claim, or such portion thereof as the applicant shall appear, from the decision of the court, to rightly possess.”

The question submitted to the court for determination is “to determine the question of the right of possession.” This section was amended (Act of March 3, 1881, Ch. 140, 21, Stat. L., 505) by further providing if title to the ground in controversy shall not be established by either party, to find and enter judgment accordingly.

The scheme which the statute presents and the scope and purpose of Secs. 2325 and 2326 and the controlling effect of the judgment on the Land De-

partment have been repeatedly considered, construed and applied.

Richmond Min. Co. vs. Rose, 114 U. S.,  
576, 585;

Iron Silver Min. Co. vs. Campbell, 135 U. S.,  
286, 299;

Shoshone Min. Co. vs. Rutter, 177 U. S.,  
505, 577;

Min. Co. vs. Tunnel Co., 196 U. S., 337,  
357.

The suit "is but a continuation of those proceedings prescribed by the laws of the United States" to have a determination of the question as to which of the contending parties is entitled to a patent.

Wolverton vs. Nichols, 119 U. S., 485, 489;  
Bennett vs. Harkrader, 158 U. S., 441, 447.

As said by the court in Richmond Min. Co. vs. Rose, 114 U. S., 576, 585, and approved in Last Chance Min. Co. vs. Tyler Min. Co., 157 U. S., 683, 693, referring to the action of the officers of the Land Department "after the decision they are governed by it. Before the decision, once the proceeding is initiated, their function is suspended."

The judgment is binding as to every fact necessarily determined by it.

Last Chance Min. Co. vs. Tyler Min. Co.,  
supra, page 695.

Each party is practically plaintiff and to succeed must prove all the acts required to make a valid location, not only as against the adverse claimant, but also as against the government.

Brown vs. Gurney, 201 U. S., 184, 190-1.

In Gwillim vs. Donnellan, et al, 115 U S., 45, 50, the requirements applicable to each of the contending parties is stated as follows:

“To entitle the plaintiff to recover in this suit, therefore, it was incumbent on him to show that he was the owner of a valid and subsisting location of the lands in dispute, superior in right to that of the defendants. His location must be one which entitles him to possession against the United States, as well as against another claimant. If it is not valid as against the one, it is not as against the other. The location is the plaintiff’s title. If good, he can recover; if bad, he must be defeated.”

As accurately and tersely said by this court:

“The exclusive right of possession is by Section 2322 of the Revised Statutes conferred only on one who has made a valid location.”

Hanson vs. Craig, 170 Fed., 62, 64; 95 C. C. A. 338.

A party cannot go on the public domain and secure possession by merely the performance of acts prescribed for location.

*Crede vs. Uinta*, 196 U. S., 337, 353;

*Hall vs. McKinnon* (C. C. A. 9th Cir.),  
193 Fed., 572, 576;

*Cook vs. Klonos*, 164 Fed., 529, 536; 90  
C. C. A. 403.

With the object and purposes of an adverse suit in mind, it is difficult to comprehend why every fact bearing upon the validity or invalidity of the respective locations is not germane, the province and within the jurisdiction of the court to consider when the issue is properly presented.

The case of *Waskey vs. Hammer*, decided by this court, 170 Fed., 31, affirmed by the Supreme Court, 223 U. S., 85, furnishes a striking illustration. In that case the location, otherwise a valid prior location, was held void because made by a person disqualified to make a valid location by reason of his having become a United States deputy mineral surveyor.

Doubtless it is unusual for a person to seek to acquire a vein or lode by means of a placer location, because to do so not only renders the location invalid, but is perpetrating a fraud upon the government. Yet when done, it is none the less within the proper scope of inquiry by a court of competent jurisdiction in an adverse case, because the right

of possession of the contending parties necessarily turns upon the placer or lode character of the ground in controversy.

That it is not, as said by the court below (198 Fed., 942, 946), "an idle act, a work of mere superogation" for the court to assume a determination of the pivotal question at issue and involved here, is clear from the construction given by the Supreme Court. Yet the court should not concern itself in respect to the binding effect of its decision upon the Land Department. When that Department in future proceedings upon appellee's pending application for patent ignores the decision and not until then, can that question arise.

To say, in the absence of express statutory exclusion that the court can ascertain some but not all of the essential facts and elements necessary and required to make a location valid and carry with it the exclusive right of possession and preference right to patent, is contradictory. No discrimination is made in the statute. No question either of law or fact necessary to ascertain whether or not all the requirements of law have or have not been complied with, and the location is therefore valid or invalid, is withdrawn or taken from the court; but on the contrary, in cases where adverse claim is permitted, jurisdiction to determine the question is exclusively vested in the court and withdrawn from the Land Department.

In this case, if a non-metalliferous lode or vein is included in the provisions of Sec. 2320, Rev. Stat.,



the inquiry is necessarily limited and confined to the form of the admitted one and only mineral deposit within the boundaries of the placer locations. The material facts in respect thereto are substantially without conflict. It is obvious that the exclusive right of possession and preference right to a patent for the ground in controversy depends wholly upon the court ascertaining and determining the form in which the deposit is found, whether or not the deposit is a lode or vein. That question, in this case, goes to the roots of a valid or invalid location. If the mineral deposit is a vein or lode, the foundation of appellee's placer locations falls. If it is **not** a "placer" the placer locations must also fail.

The discoveries made as required by law (Sec. 2320, Rev. Stat.), by the respective placer and lode claimants are and can be **appropriate** and sufficient only as to one of such claimants, depending upon the class to which the mineral deposit belongs. To be **appropriate** and effective for lode locations, that the deposit is a vein or lode in place; for placer locations, that **it is not** a vein or lode, but ground valuable for placer mining.

Steele vs. Tanana M. R. Co., 148 Fed., 678;  
78 C. C. A. 412;

Chrisman vs. Miller U. S., 313, 323;

Garibaldi vs. Grillo (Cal.), 120 Pac., 425,  
426.

The case last mentioned emphasizes the importance and necessity for proof regarding form and character. The parties had stipulated that the land in controversy was placer land. It is there said:

“The parties were competent to stipulate as to their contending and conflicting rights, but they could not by stipulation relieve themselves from proving at the trial that they had made a discovery of gold, either in placers, or in veins, or lodes, in the land, as contemplated by the laws of the United States.”

The lode claimants having properly filed an adverse claim against the application for placer patent, then every fact necessary to the determination of the right of possession and priority of right to a patent, is taken away from the Land Department by the Acts of Congress and transferred to a court of competent jurisdiction for adjudication, when suit is timely brought in support of the adverse claim.

Under the facts presented in this case, an adverse claim is not only proper but indispensable.

San Francisco Chem. Co. vs. Duffield, et al,  
— Fed., —;

Dahl vs. Raunheim, 132 U. S., 260, 261;

Butte & B. Min. Co. vs. Sloan, 16 Mont.,  
97; 40 Pac. 217.

In Dahl vs. Raunheim, 132 U. S., 260, 261, some of the consequences of a lode claimant failing

to adverse the application of a placer claimant's application for patent are pointedly stated by Mr. Justice Field as follows:

“To this application no adverse claim to any portion of the ground was filed by the defendant or any other person, and the statute provides that in such case it shall be assumed that the applicant is entitled to a patent upon certain prescribed payments, and that no adverse claim exists. The statute also declares that thereafter no objection of third parties to the issue of a patent shall be heard, except it be shown that the applicant has failed to comply with the requirements of the law. No such failure was shown by the defendant. **He is, therefore, precluded from calling in question the location of the claim, or its character as placer ground.**”

The fallacy of the reasoning of the learned Judge of the District Court in his opinion, and the erroneous basis adopted for the decision, to the effect that the court is without jurisdiction to determine in this case whether the mineral deposit is in the form of a lode or of a placer deposit, is not difficult to discover.

The proceedings under Secs. 2325 and 2326, Rev. Stat., are limited to controversies between adverse mineral claimants only. To controversies where the mineral character of the land is mutually asserted and assumed by the court.

“Adverse proceedings are called for only when one mineral claimant contests the right of another mineral claimant.”

Min. Co. vs. Tunnel Co., 196 U. S., 337;  
 Helena, etc. Co. vs. Dailey, 36 Land Dec.,  
 144;  
 Iron Silver Min. Co. vs. Campbell, 135 U.  
 S., 286, 299.

It is not provided or contemplated by the Congressional Acts, that the court in an adverse suit shall have jurisdiction to pass upon and determine the character of the land in controversies between mineral and non-mineral claimants. That question in the first instance is one exclusively for the Land Department. Consequently, notwithstanding the judgment in the adverse suit, the Land Department, previous to patent, at the instance of a protestant or on its own motion may direct a hearing to ascertain the character of the land. That class of hearings are governed by Sec. 2335, Rev. Stat., and L. O. Reg. par. 109-119.

This is far from excluding from the determination of the court in an adverse suit the question of the placer or the lode character of the mineral ground in controversy, when the answer to that question determines the validity of the location and the right of possession.

The discovery of mineral in such quantities as to justify the expenditure of money in search thereof

that will support the requirements of a discovery under Sec. 2320, Rev. Stat., either lode or placer, does not settle or determine the further question whether the land is more valuable for mineral (lode or placer) than for agricultural or other non-mineral purposes.

Taking up the cases cited and quoted from in support of the opinion of the Judge of the District Court herein, not one of them will be found to support the principle advanced by the court below.

In **Wolverton vs. Nichols**, 119 U. S., 485, we fail to discover any bearing upon the questions here. That case involved an adverse claim between placer claimants. The court below granted a nonsuit, the Supreme Court reversed the judgment and held that the defendant had "a right to have the verdict of the jury on the question at issue so as to settle the question which the Act of Congress required settled."

In **Steel vs. St. Louis Smelting & R. Co.**, 106 U. S., 447, the Smelting Company brought an action to recover possession of certain real property in Leadville. The defendant answered claiming ownership "by superiority of possessory title and priority of actual possession" of the premises as part of a townsite on the public domain; that the title of the plaintiff was derived from one Starr, to whom a mineral patent was issued embracing the premises in controversy; and the special defenses set up were that the mineral patent was void, that fraud, bribery, etc., were used to obtain it.



In the course of the opinion, and as the basis for the paragraph quoted in the opinion by the District Judge in the case at bar wherein, referring to the Land Department, the object of its creation, and the powers it possesses, the court expressed "an unpleasant surprise to find that counsel, in discussing the effect to be given to the action of that department, overlooked our decisions on the subject," etc., etc., is reflected and made perfectly plain and consistent with the position we maintain, by the preceding paragraph wherein Mr. Justice Field makes the following clear and explicit enunciation:

"Whenever, therefore, mines are found in lands belonging to the United States, whether within or without townsites, they may be claimed and worked, provided existing rights of others, from prior occupation, are not interfered with. Whether there are rights thus interfered with which should preclude the location of the miner and the issue of a patent to him or his successor in interest, is, when not subjected under the law of Congress to the local tribunals, a matter properly cognizable by the Land Department, when application is made to it for a patent; and the inquiry thus presented must necessarily involve a consideration of the character of the land to which title is sought, whether it be mineral, for which a patent may issue, or agricultural, for which a

patent should be withheld, and also as to the citizenship of the applicant."

**Clipper Min. Co. vs. Eli Min. & Land Co., 194 U. S., 220, and 33 Land Dec. 660,** remain to be noticed.

The litigation involved in those decisions has extended over a quarter of a century and up to the present time will be found reported in 7 Copp's Land Owner, 36, re Searle Placer; 11 Land Dec., 441; re Clipper Min. Co., 22 Land Dec., 527; Clipper Min. Co. vs. Eli Min. Co., 29 Colo., 377; 68 Pac., 286; Clipper Min. Co. vs. Searl, et al, 29 Land Dec., 137; Clipper Min. Co. vs. Eli Min. Co., 194 U. S., 220; Clipper Min. Co. vs. Eli Min. Co., 33 Land Dec., 660; Clipper Min. Co. vs. Eli Min. Co., 34 Land Dec., 401.

Briefly, the Searle placer was located in 1877, thereupon the county judge applied to enter the same land as a townsite for the benefit of the inhabitants of North Leadville. A hearing was ordered by the Land Department, resulting in the finding that the surveyor general's return that the land was mineral in character was not overcome and the townsite application was dismissed. (7 C. L. O., 36, supra.) Subsequently the owner of the Searle placer made application for patent including an area of about 150 acres. His application was met by adverse claims, some were settled and others eliminated by an amended survey and application including about 100 acres. Thereupon, upon the

the report of a special agent of the department and representations of residents of Leadville alleging that the ground was not placer, the Department "finding great doubt whether the ground was more valuable for placer mining than for other purposes" ordered a hearing to ascertain the character of the land, etc. Upon the hearing the land officers found "that the land was not distinctively valuable for placer mining, \* \* \* and recommended the rejection of the pending application." This ruling was approved by the Commissioner, and on appeal affirmed by the Secretary. (11 L. D., 441, *supra*.) A few days thereafter four lode mining claims, comprising about 35 acres were located within the Searle placer boundaries. The lode claimants thereupon applied for patent. The Searle placer claimant adverse and brought suit in support thereof. The issues presented and tried, were: (1) Whether the plaintiff (Searle placer claimant) was entitled to recover because of the decision of the Land Department upon the application for patent by the owner of the Searle placer that the ground included within its boundaries was not placer ground and the attempted location was for that reason void and that such decision was *res judicata* of the present controversy. (2) Assuming the existence of the valid prior Searle placer, nevertheless defendant (lode claimants) went upon the placer surface area and made locations of lode claims which were known to exist and therefore in law the same were part of the public domain. The trial court found, among other

things, that the Searle placer was duly located as required by law in 1877 and subsequently amended. On appeal the Supreme Court of Colorado was bound by that finding and consequently accepted it. (29 Colo., 377; 68 Pac., 286, *supra*).

The case was taken to the Supreme Court of the United States (194 U. S., 220, *supra*.) That court also was bound by the finding, viz., that the placer location was valid, it therefore accepted that the Searle Placer was duly located and was a subsisting valid placer location.

Mr. Justice Brewer, speaking for the court, says (p. 222):

“The defendant, on the other hand, contends that the original location of the placer claim was wrongful, for the reason that the ground included within it was not placer mining ground; that the intent of the locators was not placer mining but the acquisition of title to a large tract of ground contiguous to the new mining camp of Leadville, and likely to become a part of the townsite. In fact, it was thereafter included within the limits of the town, and on it streets and alleys have been laid out and many houses built and occupied by individuals claiming adversely to the placer location.”

The court held that it had no jurisdiction to review the decision upon a question of fact, that—

“It must therefore be accepted that the

Searle placer was duly located \* \* \* that there was a subsisting valid placer location."

The court then clearly points out that notwithstanding the judgment in the adverse suit in favor of the placer claimant their rights to a patent are not settled beyond the right of inquiry by the government, or that the judgment necessarily gives to them the lands in controversy, that it remains for the Land Department to ascertain the character of the land; summing up thus (p. 234):

"The land office may yet decide against the validity of the lode locations and deny all claims of the locators thereto. So also it may decide against the placer location and set it aside, and in that event all rights resting upon such location will fall with it."

After this decision, the successful placer claimant in the adverse suit sought to enter the alleged lodes under the judgment roll. The Commissioner directed a hearing touching the character of the land embraced within the placer location "whether patentable placer or not at the date of the application for lode patent." (33 L. D., 660, 671, *supra*.) The Secretary affirmed that order. (34 L. D., 401, *supra*.) In the course of an exhaustive discussion of the subject the secretary says (page 403):



“The Department recognizes and reaffirms to its fullest extent the general principle, so often declared by the courts and the Department, that ‘the question of the right of possession’ as between contending mineral claimants is exclusively of judicial cognizance, and that the award of that right by a court of competent jurisdiction is binding upon the parties and the land department. In the final analysis, however, this principle has always in view the ‘right of possession,’ which is the essential basis of the legal title obtainable under the mining laws, as counsel for respondents affirm it to be. That the principle contemplates, as the subject of judicial disposition, a right of possession which shall thereafter be found by the land department in the exercise of its jurisdiction, to be effective for patent purposes is manifest from the provisions of section 2326 whereunder the adjudged right may, upon submission of the judgment roll and ‘without giving further notice,’ be made the basis of the paramount title. See in this connection, *Gwillim vs. Donnellan*, 115 U. S., 45, 50-1.” And again (p. 408), “A location which the courts will recognize as valid may be predicated upon a discovery of mineral which would fall short of establishing the mineral character of the land under the settled and approved rule of determination; but to prevail eventually the location must be shown to embrace mineral land of corresponding char-

acter, lode or placer, which may become the subject of mineral patent."

### III.

## THE LODE LOCATIONS OF APPELLANTS WERE LAWFULLY INITIATED.

The prior placer locations of appellees being fatally defective, invalid and void, the ground embraced therein was open to peaceable adverse entry for discovery and location by appellants under the Acts of Congress, although they knew of the attempted prior placer locations upon it.

This court has settled that proposition.

*Horne & S. Co. vs Snyder*, 87 Fed. 385, 389; 105 C. C. A., 217.

Hanson vs. Craig, 170 Fed., 62; 95 C. C. A., 338.

Cook vs. Klonos, 164 Fed., 529, 535-6, 90 C. C. A. 403;

Johanson vs. White, 160 Fed., 901, 88; C. C. A. 83.

The rule is well established:

Olive L. & D. Co. vs. Olmstead, 103 Fed., 568, 573.

Brown vs. Oregon King Min. Co., 110 Fed., 728.

San Francisco Chem. Co. vs. Duffield,  
 (C. C. A. 8th Cir.), —Fed.—;  
 Belk vs. Meagher, 104 U. S., 279.  
 Lockhart vs. Johnson, 181 U. S., 516, 527.  
 Walsh vs. Henry (Colo.) 88 Pac., 449.

In Thallmann vs. Thomas, 111 Fed., 277, 278-9;  
 49 C. C. A. 317, approved in San Francisco Chem.  
 Co. vs. Duffield, *supra.*, —Fed.—, the rule is  
 clearly enunciated, where it is said:

“A valid claim to unappropriated public  
 land cannot be instituted while it is in posses-  
 sion of another who has the right to its posses-  
 sion under an earlier lawful location. *Risch vs.*  
*Wiseman* (Or.) 59 Pac. 1111; *Seymour vs.*  
*Fisher*, 16 Colo. 188, 27 Pac. 240. Nor can such  
 a claim be initiated by forcible or fraudulent  
 entry upon land in possession of one who has  
 no right either to the possession or to the title.  
*Atherton vs. Fowler*, 96 U. S. 513, 516, 24 L.  
 Ed. 732; *Trenouth vs. San Francisco*, 100 U. S.  
 251, 256, 25 L. Ed. 626. But every competent  
 locator has the right to initiate a lawful claim  
 to unappropriated public land by a peaceable  
 adverse entry upon it while it is in the posses-  
 sion of those who have no superior right to  
 acquire the title or to hold the possession. *Belk*  
*vs. Meagher*, 104 U. S., 279, 287, 26 L. Ed., 735;  
*Johnson vs. Towsley*, 13 Wall, 72, 20 L. Ed.,  
 485; *Nevada Sierra Oil Co. vs. Home Oil Co.*

(C. C. 98 Fed., 673, 680.) Any other rule would make the wrongful occupation of public land by a trespasser superior in right to a lawful entry of it under the acts of congress by a competent locator. There was nothing in the possession of the lode in this land by the complainants many feet below its surface, and their wrongful removal of ore from it, nor in the defendant's suspicion or knowledge of this trespass, nor in the fact, if it be a fact, that he learned of the trespass through his employment as a miner and shift boss of the complainants, to prevent him from making an honest and valid location of a mining claim upon this unappropriated portion of the public domain in accordance with the provisions of the acts of congress which offered him this privilege."

The appellants did not violate or transgress in any manner the established rules in making and maintaining their lode locations.

The facts are as follows: On the 15th and 16th days of November, 1907, the appellants peaceably entered upon the ground then vacant and unoccupied (Rec. 119, 152-3), put up notices at discovery points for the several lode claims and partly marked the boundaries of the claims. On the 20th day of November, 1907, they returned and completed making the survey and marking of boundaries by November 25th, 1907. (Rec. 110, 111.) On November 26th, 1907, they returned and remained until

December 9th, 1907, (Rec. 122), and performed the discovery work for each of the lode claims as required by the laws of Idaho. On December 6th, 1907, after the discovery work had been performed on all of the lode claims, except only the Mt. Pleasant, and while engaged in completing such work on the Overton (Rec. 144) Mr. Sullivan and Mr. Taylor, representing the San Francisco Chemical Company, went upon the ground and found Mr. Colbath and Mr. Sampson digging a pit, who stated they were working for Mr. Duffield and Mr. Jeffs. They were informed that the ground had been located and belonged to the San Francisco Chemical Company. The men left work (Rec. 489-492). The next day the work was peaceably resumed and continued until completed. (Rec. 194.)

On December 6, 1907, there was also a conversation between Mr. Duffield and Mr. Sullivan, et al., at Montpelier. (Rec. 145-150; 492-3.)

When the annual work for 1908, 1909 and 1910 was being done by appellants, objections were made by appellee. The bearing or importance of that fact is not perceptible, but if it be important, we hereby refer to the record: For the year 1908 (Rec. 169-175, 189, 490). For the year 1909 (Rec. 175). For the year 1910 (Rec. 168, 230, 231, 485, 486, 838-840). In fact it has been stipulated that appellants performed the requisite discovery work, duly marked the boundaries of their lode claims and each of them, and posted the location notices and per-



formed the requisite work of \$100.00 for each claim and in each calendar year. (Rec. 453-4.)

The rule would be the same if the placer locations were **valid** by reason of proof that they contained extrinsic of the mineral deposit in controversy ground valuable for placer mining purposes (which is not the fact and so conceded.) The "known" lode or vein in place would be subject to location openly and peaceably by the first to appropriate it by a valid lode location, whether it be the placer claimant or others.

1. Lindley on Mines. (2nd Ed.) Sec. 413.

The subject will be found exhaustively treated in Mt. Rosa Min., Mill & L. Co. vs. Palmer, 56 Pac. 176; 26 Colo. 56. The syllabus, sub-div. 2 and 3, is as follows:

"2. A placer location confers neither title to nor possession of, nor withdraws from subsequent location by others, known lodes or veins of mineral in place within its limits, under Rev. St. U. S. Sec. 2333, providing that a placer patent which fails to include an application for a vein or lode claim known to exist within its limits shall be deemed a conclusive declaration that the placer claimant has no right thereto.

"3. Since a placer patent confers no possession to known lodes or veins within its limits, a subsequent locator of a vein or lode within

the limits of a placer claim is not a trespasser, as against the placer claimant, within the rule that a trespasser on a lawful possession can acquire no rights."

That this lode or vein, within the limits of the placer locations was "known" to exist by the appellee and its predecessors in interest is undoubted. The old (Jones) lode locations had been forfeited and abandoned, thereby leaving the lodes subject to appropriation by peaceable entry and compliance with the requirements for locating veins and lodes. This appellants did.

A different rule prevails where a person goes upon a prior **valid** placer location and makes a location to prospect for **unknown** lodes. That is not permitted without the acquiescence of the placer claimant, express or implied.

Clipper Min. Co. vs. Eli Min. & L. Co.,  
194 U. S., 220, 230.

We have no such case presented here. The lodes were known and located and explored first in 1904. Then abandoned. The appellants in making the lode locations in 1907 had the lawful right to appropriate the former discoveries of the lode.

Hayes vs. Lavagnino, 17 Utah, 185; 53  
Pac., 1029.

## IV.

THE MINERAL DEPOSIT IN QUESTION IS  
A VEIN OR LODGE WITHIN THE PURVIEW  
OF SECTION 2320, REVISED STATUTES  
OF THE UNITED STATES.

Within the ground extending throughout the length of the lode and placer claims from north to south there exists but the one valuable mineral deposit. Each party is seeking to secure the same identical mineral deposit, the complainants by lode and the defendant by placer locations.

The paramount question in this case is reduced to a determination as to which of the two classes of deposits under the mining laws this valuable mineral deposit belongs. That, we believe, is the sole question involved.

The provisions of the Act of Congress bearing upon the question are contained in Sections 2318, 2319, 2320, 2322, 2329 and 2333, Revised Statutes of the United States.

The legislation clearly separates and divides into two **distinct** classes the mineral lands of the United States, to-wit:

(a) Those containing veins or lodes of quartz or other rock in place bearing mineral of value of any kind or character that may be found therein. (Sec. 2320.)

(b) Those "usually called 'placers,' including all forms of deposits, excepting veins of quartz or other rock in place." (Sec. 2329.)

It further clearly appears from the Act that these two classes of deposits are completely distinct and separate from each other, and when found to exist in the same superficial area they may be located by different persons and separately patented. (Sec. 2333.)

If the deposit is a vein or lode within the contemplation of the Acts of Congress, then the placer locations are nullities. The ground included is non-placer ground. The deposit can be legally acquired only by lode locations. The inquiry then is solved by determining whether or not the mineral deposit in question belongs to the class known as "veins or lodes."

With singular certainty, the evidence presented shows that the only known mineral deposit contained within the survey limits of the several placer claims, is a mineralized zone and deposit **of rock in place in the mass of the mountains extending throughout its entire length between well defined walls of neighboring rock. That it has a definite dip and strike and that it is of commercial and economic value.**

With these controlling characteristics, this deposit is unquestionably a vein or lode within the purview of the mineral laws of the United States.

- Iron-Silver Min. Co. vs. Cheesman, 116  
U. S., 529-534-536;  
Reynolds vs. Iron Silver Min. Co., 116  
U. S., 687-695;  
United States vs. Iron Silver Min. Co., 128  
U. S., 673-680;  
Iron Silver Min. Co. vs. Mike and Starr  
G. & S. Min. Co., 143 U. S., 394-404-  
420-1;  
1st Lindley on Mines, (2d Ed.) Sec.  
292-294.  
Noyes vs. Clifford, (Mont.), 94 Pac. 842-  
847.

In the foregoing authorities is found the general legal definition of a "vein" or "lode" under the Act of Congress, mostly involving the question whether the question whether the deposit is to be classed under said Act as a lode or vein or as a placer.

The one there quoted, applied and approved and held sufficient for all practical purposes for determining the existence of a vein or lode under the Act as distinguished from a "placer," is the familiar definition by which Judge Hallett defined those terms, as follows:

"To determine whether a lode or vein exists, it is necessary to define those terms: and, as to that, it is enough to say that—



“A ‘vein’ or ‘lode’ is a body of mineral, or mineral-bearing rock, within defined boundaries in the general mass of the mountain.”

He then proceeded to say:

“In this definition the elements are the body of mineral or mineral-bearing rock and the boundaries; with either of these things well established, very slight evidence may be accepted as to the existence of the other,  
\* \* \* In the existence of such a body, and to the extent of it, boundaries are implied. On the other hand, with well defined boundaries, very slight evidence of ore within such boundaries will prove the existence of a lode.

“Such boundaries constitute a fissure; and, if in such fissure ore is found, although at considerable intervals and in small quantities, it is called a lode or vein.”

Judge Miller, in (Stevens vs. Williams, 1 McCrary, 480-488) referring to that definition of Judge Hallett, said:

“I do not know a better or more comprehensive definition than that.”

In *Iron Silver Min. Co. vs. Mike and Starr G. and S. Min. Co.*, supra, this definition was held

applicable to a mineral deposit described by the Court as follows: (p. 399-400.)

“The fact is, there was an earnest inquiry as to whether the Court had not erred in its prior and repeated ruling, that a known lode, as named in Section 2333 of the Revised Statutes, is something other than a located lode; and, also, whether, in view of the disclosures made in this, as in prior cases, of the existence of a body of mineral underlying a large area of country in the Leadville mining district, whose general horizontal direction, together with the sedimentary character of the superior rock, indicated something more of the nature of a deposit like a coal bed than of the vertical and descending fissure vein, in which silver and gold are ordinarily found, it did not become necessary to hold that the only provisions of the statute under which title to any portion of this body of mineral, or the ground in which it is situated, can be acquired, are those with respect to placer claims.”

The decision in that case, which was twice argued, the second time upon six specific questions, among them: (P. 395.) “First. What constitutes a ‘lode’ or ‘vein’ within the meaning of Sections 2320 and 2333 of the Revised Statutes? Second. What constitutes a ‘known lode or vein’ within the meaning of Section 2333?” Stands without qualification or exception and plainly would seem to con-

clude any possible doubt upon the question and definitely places this deposit in the category of veins or lodes under the Act of Congress, as distinguished from "placer claims."

The description of a lode as given by Mr. Justice Field in the celebrated case of *Eureka Cons. Co. vs. The Richmond Co.*, 4 Saw., 302, 312, viz.:

"We are of the opinion, therefore, that the term (lode) as used in the Acts of Congress is applicable to any zone or belt of mineralized rock, lying within boundaries clearly separating it from the neighboring rocks."

clearly includes all bedded deposits. It applies to this case.

*San Francisco Chem. Co. vs. Duffield,*  
supra., —Fed.,—

*Meydenbauer vs. Stevens*, 78 Fed., 787.

A lode may and often does contain more than one vein.

*United States vs. Iron Silver Min. Co.*, 128  
U. S. 673, 680.

In *U. S. Min. Co. vs. Lawson* (C. C. A. 8th Cir.) 134 Fed., 769, 772-3, (affirmed by the Supreme Court, 207 U. S., 1)—opinion by Van Devanter, C. J.—a belt of limestone from 100 to 200 feet in

width, confined between well defined walls, was held to constitute a single broad vein or lode of mineral-bearing rock.

That this deposit does not come within the class of deposits subject to location and acquisition as placer claims under the Act of Congress is apparent from the legal construction given to the act defining placer claims.

Reynolds vs. Iron Silver Min. Co., 116

U. S., 687, 695;

Clipper Min. Co. vs. Eli Min. & Land Co.,

194 U. S., 220, 228;

Webb vs. American Asph. Min. Co., 157

Fed., 203, 204; 84 C. C. A., 651;

United States vs. Iron Silver Min. Co., 128

U. S., 673, 679.

As said in Reynolds vs. Iron Silver Min. Co. *supra*, in distinguishing the two classes of deposits: (Pg. 695.)

“Placer mines, though said by the statute to include all other deposits of mineral matter, are those in which this mineral is generally found in the softer material which covers the earth’s surface, and not among the rocks beneath.”

Mr. Justice Field, in United States vs. Iron Silver Min. Co., *supra*, defined placer as distin-

guished from a vein or lode under the Act of Congress, as follows:

“By the term ‘placer claim’ as here used, is meant ground within defined boundaries which contains mineral in its earth, sand or gravel; ground that includes valuable deposits not in place, that is, not fixed in rock, but which are in a loose state, and may in most cases be collected by washing or amalgamation without milling.”

In *Clipper Min. Co. vs. Eli Min. Co.*, *supra*, it is said:

“A placer location is not a location of lodes or veins underneath the surface, but is simply a claim of a tract or parcel of ground for the sake of loose deposits of mineral upon or near the surface.”

That this mineralized zone and deposit is “in rock in place” is too clear to permit of any discussion.

1st Lindley on Mines (2d Ed.) Sec. 298,  
et seq.

The witnesses all admitted that fact. One of them (Mr. Weeks) particularly emphasized the fact by the assertion in substance that it was in rock in place as much as any deposit within sedimentary



rocks could be in place. That the deposit is in the mass of the mountains with continuity, definite dip and strike, is admitted. Also that the mineralized zone and deposit lies between walls prominently and clearly marking and defining its boundaries, is established without contradiction and conceded, provided, however, instead of walls, we say roof and floor, or overhanging and underlying rock, or use some descriptive term other than "walls."

That the deposit is a valuable mineral deposit is also admitted; naturally so, as each party is seeking to secure it for its commercial value only.

The decisions of the Land Department in reference to issuing patents for Western phosphate deposits, while not controlling upon the court, are undoubtedly entitled to proper consideration.

In the absence of any contest, by protest or otherwise, the Department has issued one placer patent in the case of the "Waterloo," and in three instances Final Entry was allowed by the local land office as placers. (See Rec. Defts. Ex. 6, 7, 8 and 9, (8 and 9 being duplicates), p. 843-848.)

This question, however, had never reached or been passed upon by the Secretary of the Interior until recently, (Dec. 7th, 1912), in re Harry Lode Mining Claim. In that case the Secretary's instructions issued to pass the claim to patent as a lode. After reviewing many authorities, the Secretary concludes by saying:

“From the foregoing, it is clear to the Department that a deposit of phosphate rock, such as that hereinabove described, confined, as it is shown to be, between well defined boundaries, constitutes a lode or vein of mineral-bearing rock in place within the general mass of the mountains, and hence is subject to disposition only under the provisions of the lode mining law.”

As sufficient time has not elapsed for publication of that decision in the regular volumes of reports, we print it in full in the appendix hereto.

Since that decision, the Secretary has already ordered cancelled, two of said Final Entries (Ex. 6 and 7), with leave to change from placer to lode locations, providing Executive order of withdrawal of phosphate lands can be so modified.

The first contest was made by the San Francisco Chemical Co., (the same company appellee here), by protesting March 23, A. D. 1908, against the issuance of a patent to Bradley Bros., for the “Lorine” and other lodes under the laws relating to lode claims. The Commissioner decided in favor of the lodes.

Because the decision referred to is not published in readily accessible legal publications, in the appendix hereto we have caused to be printed in full the memorandum decision on the Lorine lode, which we take from the public document entitled:

**“PHOSPHATE LANDS  
HEARINGS  
HELD BEFORE THE COMMITTEE ON THE  
PUBLIC LANDS OF THE HOUSE OF  
REPRESENTATIVES  
on  
December 17, 1908,  
January 13, 15, 16, and February 2, 1909  
on  
H. R. 21873  
TO DEFINE THE MANNER IN WHICH PUB-  
LIC LANDS CONTAINING VALUABLE  
DEPOSITS OF PHOSPHATE AND  
PHOSPHATE ROCK MAY  
ACQUIRED.”**

This decision, it there appears, had the approval of the Assistant Secretary of the Interior.

The second and only other contest was the one in re Harry lode, *supra*. That contest was decided by the Commissioner in favor of the lode claimant September 24th, 1910. On motion for review, the Commissioner, January 10th, 1911, directed a further hearing. We feel safe in saying that in every contested case involving similar Western phosphate deposits, the Department has decided in favor of the validity of the lode locations, and against the validity of the placer locations. We find no case to the contrary, or any contested case where placer patent has been allowed.

## WATERLOO PLACER.

This claim includes a portion of the same mineral deposit. It is situated adjacent to the ground in controversy. In the memorandum decision by the Commission in re Lorine Lode before referred to and found in the Appendix hereto, the circumstances under which a placer patent was issued for the Waterloo are explained. In its protest against the issuance of a lode patent to the Lorine lode, the San Francisco Chemical Co., among other things, stated:

“That they are already owners of a certain placer known as the Waterloo placer, whose geological formation is identical with that included within the boundaries of said Lorine Lode.” They also call attention to the fact, “that prior to the time patent was issued for said Waterloo placer, a memorandum was written, respecting the formation of deposit included within its exterior limits \* \* \* and that in said memorandum said deposits were regarded as coming within the purview of the laws regarding placer claims,” etc.

It further appears that protestants submitted certain plats connected with the Waterloo claim and transcripts of certain testimony submitted in June and September, 1905, before an examiner in the case

of Charles C. Jones vs. William S. Goodfellow, et al, removed to the United States Circuit Court for the District of Idaho, involving an adverse claim filed by the lode claimant against the said Waterloo placer. It is further said:

“The testimony set forth in said transcripts has been heretofore gone over very carefully and epitomized in office memorandum of December 12, 1905, approved by the honorable commissioner, W. A. Richards, under date of December 27, 1905.” Again: “It is to be observed that the formation of the deposit contained within the said Waterloo placer is not now under consideration, and, further, that when it was under consideration it was specifically stated in said office memorandum of December, 1905, that while the deposit covered by the Waterloo might, without serious objection, be located and patented as lodes, it was perhaps better to consider them as placer deposits, thus conforming to the view of geologists. It may be stated in this connection that at and long prior to the time of the preparation of said memorandum of December 12, 1905, all of the entries for lands embracing phosphate deposits related to placer locations, and, further, that at the time of the entry of the land included within the said Waterloo placer limits there was not then existing any protest or adverse claim against the same. In other words, it was spe-



cifically stated in said office memorandum that the decision applied only to the Waterloo placer, and was not to be considered as an established precedent."

The circumstances under which the Waterloo placer patent issued was brought out by counsel for Appellee from the government report by Gale & Richards, and will be found (Rec. 396.) After referring to the fact that the Waterloo patent was granted as a placer, and the Bradley claims (Lorine et al) were subsequently patented as lodes. It is there said:

"As previously stated, prior to the granting of the Waterloo patent, all entries for phosphate lands were made in the Florida fields, and presumably covered deposits of true placer type, but it appears that the distinction between these deposits and the phosphate beds of the western field was, perhaps, not clearly brought out at that time."

Mr. Sullivan testified in relation to the Waterloo placer (Rec. 493, 501, 502) to the effect that Mr. Jones had lode locations over each of the placer locations exactly the same as the Duffield & Jeffs locations. That Mr. Jones relinquished or abandoned his lode rights "and permitted the locators to go ahead and patent this ground without protest." (Rec. 502.)

## CLAIMS ADVANCED BY APPELLEE.

With the deposit in place and position in the mass of the mountain between well defined walls, as the undisputed evidence shows, it remains to consider the grounds upon which the appellee relies (other than that the deposit is non-metallic) to take this mineral deposit out of the class of lodes and veins within the purview of Section 2320, Rev. Stat. To bring the matter directly to the attention of the Court, we now quote from the leading witness for the appellee, Mr. Fred B. Weeks, late of the United States Geological Survey. (Rec. 275.)

He testified that the general dip of the strata on the claims is from twelve to thirty-five degrees to the west, strike north and south. (Rec. 570, 571.) That he followed the outcrop of the lower phosphate bed and noted its position on Defts. Ex. 2 by heavy black line. (Rec. 529-530.)

"Q. What do you find there from your examination in the way of the underlying rock?

A. The underlying rock is a silicious limestone.

Q. And on top of this silicious limestone what did you find?

A. The phosphate series.

Q. Of what thickness?

A. About 120 feet thick, I think the entire series is.

Q. And it varies, does it not?

A. Well, I couldn't say as to that, because

there are very few places where the entire thickness is shown; but I am giving it where I have measured it, where it is exhibited.

Q. And on top of this series what is there?

A. Cherty limestone.

Q. Forming the upper boundary?

A. Yes, sir.

Q. Within this series what do you find? (Rec. 589.)

A. A series of phosphate beds, and limestone and shale.

Q. Can you tell us how silicious some of the dividing beds are in this phosphate series?

A. That I couldn't say. They probably contain some silica, but not in any considerable amount so that one would call a layer within the phosphate series a silicious limestone.

Q. Now, in both places you found this phosphate series, bounded as you have described, in place in the mass of the mountains, did you not?

A. It is in place exactly as the overlying and underlying rock are in place in the mountain.

Q. And it is in place as much as any other rock is in place in the mountain, is it not—can be in place?

A. Yes, sir—in that way.

Q. Well, is there any question in your mind about it being in place?

A. Oh, I don't think so.

Q. What do you understand by a lode?

A. A lode would be a rock mass containing

metallic minerals. It may be that it has some distinct form, and it may have a very irregular form.

Q. It must contain a metallic mineral?

A. Yes, sir. (Rec. 590.)

Q. Would you agree with this definition of a lode or vein, namely: as a body of mineral, or mineral body of rock, within defined boundaries, in the general mass of the mountain? (No answer.)

(The last question was repeated.)

A. No, sir.

Q. Wherein do you differ? (Rec. 591.)

A. It might be mineral-bearing without containing metallic minerals.

Q. That is the only difference?

A. Yes, sir.

Q. In the ground under consideration in these several cases, do you find any conditions not complying with the definition I have just asked you about?

A. Yes, sir.

Q. What?

A. They don't contain any metallic minerals—

Q. I will read you again: Supposing that a vein or lode is a body of mineral or mineral body of rock within defined boundaries in the general mass of the mountain; would you say that the deposit or deposits in question come within such a definition?

A. They do not.

Q. In what respect do they differ?

A. They differ in respect to its metallic contents; but the definition you have given is not a

comprehensive definition of a vein; therefore this deposit varies from the proper definition of a vein.

Q. I am asking you upon the definition I gave you, whether proper or otherwise. If you don't understand it, the Reporter will read it.

A. I think I understand it. My statement is that it differs from it because of its lack of metallic contents. (Rec. 592.)

Q. Well, taking the definition as I have given it to you, wherein do you distinguish this deposit or these deposits under consideration?

A. The phosphate deposits do not contain any metallic minerals—ores.

Q. Well, inasmuch as the question I have asked does not imply any metallic mineral, wherein (I ask you again) does the deposit or deposits under consideration fail to come within the definition suggested?

A. I don't see that I can answer your question more specifically than I have already stated;—because it lacks in metallic constituents.

Q. It is leaving out entirely, Mr. Weeks, metallic constituents; and leaving that out, wherein is there any difference?

A. The phosphate deposit is a mineral-bearing rock, and in this case it agrees with the definition you suggested. (Rec. 593.)

Q. This deposit is a continuous body?

A. Yes, sir. (Rec. 594.)

Q. Suppose that five feet in width or thickness of this phosphate rock, instead of being found



lying in place, conformable to the stratification, existed in a fissure, cutting the beds; what would you say as to the fissure so filled constituting a lode or vein? (Rec. 600.)

A. I couldn't say anything about it, because it is simply a physical impossibility for this bed to have occupied any such a position.

Q. Assume, notwithstanding, that it did; please answer.

A. Well, your assumption is absurd from my standpoint, and therefore I cannot use it. When I say that it cannot exist under those conditions, why I don't see how I am going to assume anything about it.

Q. You have testified this morning to a fissure cutting the bed filled with gilsonite, or asphaltum, or some hydro-carbon, it makes no difference what; have you not?

A. Yes, sir.

Q. Now, just assume that that fissure, of the width or breadth of five feet, was filled with this material.

A. Well, the fact is, that such a fissure cannot be filled with this material.

Q. Suppose it was; what would you say as to it being a lode or vein?

A. I haven't anything to say of such a supposition. It is unreasonable.

Q. In what respect is it so unreasonable that you cannot answer?

A. Because you couldn't fill a fissure with this material. (Rec. 601.)

Q. Assuming such a condition to actually exist, and assuming that such a condition did exist; wherein would it not be a lode or vein, in your opinion?

A. I don't care to make an answer to an unreasonable supposition. I consider that so unreasonable that I can't answer it.

Q. Now, supposing that this deposit, in the form it is now found, was valuable for gold or silver or copper or lead; what would you say as to it being a lode or vein?

A. I think it would depend upon the form and character of such a deposit of gold or silver or lead, or other materials that I mentioned, as to whether I would consider it a vein or lode. (Rec. 603.)

Q. I say, sir, in the form and character in which this deposit is now found, as you have described it, with strike and dip, in place, between walls, in the body of the mountain?

A. I don't think, if it occupied the same position and occurred in the same form and character as this phosphate bed, that it would be a vein or lode.

Q. It would be a placer, would it?

A. No; I shouldn't term it a placer in the true—(Rec. 604.)

Q. What would you term it?

A. I don't know of any distinct name you could call it, other than a bed, if it existed in the same form and character as this does.

Q. Wherein would it not be a vein or lode, in your opinion?

A. Because it is the original deposition of the material in the place in which it was formed.

Q. This gold or silver or copper or lead matter?

A. Yes, sir. (Rec. 604.)

Q. Assume that this deposit that dips 85 degrees that you have described, consisted of apatite instead of the present—of the materials that you have described here; what would you say as to whether or not it would be located as a lode or vein? (Rec. 607.)

A. If this material comprising this bed of phosphate was composed entirely of apatite, in its crystalline form, it would be a mineral-bearing deposit.

Q. Would it be a ledge or vein, in your opinion, and locateable as such? (No answer.)

Q. We are waiting.

A. Yes, sir, I understand. I think there are conditions under which this bed, as a whole—composed entirely as a whole of the mineral apatite, might be located as a vein or lode.

Q. Properly so, in your opinion?

A. Yes, sir.

Q. And I will ask you now the same question, substituting in the place of apatite, paramorphite?

A. It might be.

Q. Why do you say 'might be'?

A. Well, there might be a difference of opinion

about it, in my opinion. As I said, under proper condition it probably would be, or could be.

Q. And your opinion is that it would be proper to locate it as a lode or vein?

A. When I answered yes to that question, my answer was under the supposition that this whole bed represented by the phosphate would be represented by the mineral form paramorphite, as you suggest.

Q. That was the question. That is to say, of economic or commercial value?

A. Yes, sir.

Q. Isn't phosphorite an allotropic form of apatite? (Rec. 608.)

A. Phosphorite is a variety of apatite, which has a given density, form, and its particular structure being fibrous, or radiating.

Q. Assume now, if you please, that this deposit, with the dip, strike, position and place as you have described it, was phosphorite; in your opinion would it not be properly located as a vein or lode?

A. Bearing in mind that the whole bed is to be made up entirely of the variety of apatite called phosphorite, it would be located as a vein or lode.

Q. I wish you would, if you can, answer the question without any further assumption than the question conveys.

A. Well, I am answering it with that in mind that I have stated.

Q. Can you answer the question yes or no?

A. No, sir.

Q. Why?

A. I don't think it can be answered that way.

Q. Well, why?

A. It would not be a proper answer.

Q. Why not?

A. Because your answer would be incorrect, if you said yes or no.

Q. Tell us why.

A. I don't see how I can go any further.

Q. You can't explain why it would be incorrect?

A. Other than what I have said. (Rec. 609.)

Q. Now, Mr. Weeks, a miner or a prospector desiring to make a location, finding a valuable deposit of mineral in the mass of the mountain, with a regular defined dip and strike, and between walls of sedimentary formation; what additional facts would you have to have to determine—before he could intelligently determine whether it was a lode or vein subject to location as such?

A. I think it would be necessary for him to determine from the examination of the bed, whether it had or had not the characteristics of a vein or lode. (Rec. 612.)

Q. That fully answers the question, does it?

A. Why, there might be other considerations; I think that is the principal one—the determining factor.

Q. Well, is there any other, in your opinion?

A. I think that covers the ground.



Q. If the prospector found that the mineral deposit conformed to the stratification; then it is your opinion, is it not, that it is not a lode or vein?

A. It would in most cases wherein the vein or lode would follow along the bedding-planes between the sedimentary strata.

Q. Any other exception?

A. I think not.

Q. Now just illustrate what you mean by the exception you have just given?

A. Where the mineral-bearing solutions, penetrating the strata of the earth's crust, instead of cutting across a bed finds the point of least resistance along the bedding-planes between these beds—would constitute the principal example.

Q. In other words, the prospector would have to determine as to the action of the mineral-bearing solutions; is that it?

A. He would determine that from his observation of what the material itself said.

Q. That would be one of the things he would have to determine?

A. Yes, sir; and he would determine it in that way.

Q. He would determine it in what way?

A. By his observation.

Q. Of what? (Rec. 613.)

A. Of the bed of the material he was examining.

Q. What observation would be necessary to make that determination?

A. Why, he would find an exposure of the material that the ore-bearing horizon was following the line between two sedimentary strata—an observation not very difficult to make.

Q. Well, if he found that would it be a vein or a lode?

A. Yes, sir.

Q. It would be?

A. Yes, sir.

Q. Then in your opinion it would be necessary—it would be limited only to deposits formed from solutions?

A. A vein or lode would be.

Q. In other words, the prospector in such a case would have to determine the source from which the mineral came, would he?

A. No, sir.

Q. He would not be?

A. No, sir.

Q. The manner in which it came?

A. In a sense, yes, in that the mineral-bearing solution had followed along this bedding-plane, would be the manner in which it came into its place.

Q. Then in a sense it would be necessary to determine the manner in which the mineral solution came?

A. Yes, sir.

Q. If they came and were deposited by such action, it would be a vein or lode, in your opinion?

A. Yes, sir.

Q. If on the contrary it came by having been

placed where it is before the period of the uplift, or deformation, it would not be a vein or lode; is that right? (Rec. 614.)

A. I don't quite see that connection. Will you read that?

(The last question was repeated.)

A. I don't think so.

Q. It would still be a vein or lode?

A. Yes, sir, it might be.

Q. It might be?

A. Yes, sir.

Q. Why do you say 'might' in that connection?

A. Well, I will say it is.

Q. Yes—a vein or lode?

A. Yes, sir.

Q. Then, if I understand you, if at any past period, whatever position it might have occupied, the mineral deposit came in solution and was deposited, forming beds, it would at the present time be a lode or vein? Is that it? (No answer.)

Q. In other words, to make it a little clearer, is it of any importance, in your opinion, the determination of when the mineral deposit was formed?

A. It is of importance in this sense, that the mineral-bearing solutions from which the minerals are deposited, enter into a rock already formed, and that the formation of such ore-zones are later than the materials which the ore-bearing solutions are penetrating.

Q. Then it is your opinion that a prospector, in determining whether the deposit found in the

form you have described to be the one involved in these cases, is a vein or lode and locateable as such, he must determine whether it was filled with the mineral substances—whether it has been originally rock that (Rec. 615) has been subsequently filled with mineral substances; is that it?

A. Yes, sir.

Q. How would that be determined by the miner—the ordinary miner and prospector?

A. In the ordinary vein or lode from the outcrop the prospector could determine more or less accurately the boundaries of his vein or lode, and the fact as to whether the ore had come into such rock subsequent to the formation of the country rock.

Q. He would know all about it, eh?

A. Oh, I don't know that he would know all about it. He would from the general observation he would make, I think. In fact, I have talked with many prospectors who have exhibited such a knowledge. (Rec. 616.)

On re-direct examination (by Mr. Budge) this witness testified:

Q. Now, Mr. Weeks, on cross-examination you stated, if I remember the testimony correctly, that if there were a fissure containing apatite, or a deposit of apatite—a fissure containing this apatite in its entirety—that it would probably be a vein or lode; but if it contained only a portion—of phosphorite, instead of apatite—contained only a portion of phosphorite, that you thought it would not be a vein

or lode. I want to ask you if you desire to correct your testimony in that respect?

A. I think I was considerably confused in answering those questions; and what I would say at the present time is, that if a fissure containing or made up of this phosphorite in its entirety, it would not be located as a vein or lode, because it was not metallic, and because it did not contain any gangue mineral or material from which the valuable part would be extracted.

Q. But would be mined as a whole?

A. Yes, sir. But if the fissure was formed of phosphorite (Rec. 741) in part and contained other materials from which the phosphorite would be extracted, it might be a question then as to whether it should be located as a vein or lode.

Q. What is the probability, as compared if the whole fissure was phosphorite?

A. Why, there would not be that doubt in my mind.

Q. There would not be the same doubt?

A. No, sir.

Q. For what reason?

A. Well, for the reason that the fissure being completely occupied by this phosphorite, the material would be mined as a whole, and there would be no gangue present from which to extract the valuable material." (Rec. 742.)

Mr. Breger, a witness for appellant, who examined the ground in question, corroborated the



testimony of Mr. Weeks as to the nature of this formation, the underlying bed and overlying bed as correct in its essential features. (Rec. 672-3.)

Mr. Bell, another witness for appellee, testified. (Rec. 791-3):

“Q. Well, what characteristic of a vein do these deposits lack, except the metallic character of the contents?

A. Why, the principal characteristics that they lack is a decided absence of a selvage separating the valuable mineral from the wall rock, together with the unaltered condition of the wall rocks, which remain practically as they were consolidated when they were laid down. If it were a vein or a lode those conditions would not be manifested in their original form; they would be altered by the action of acid solutions leaching the rock, replacing it with silica, or dissolving it out and replacing it with something else, some other form of mineral, and there would be an altered condition of the primary sedimentation. But where it has those primary conditions—the unaltered fossils are still there the way they were laid down; the fossil rock, apparently, from its oolitic structure, shows the concentric wave action, of motion, of rubbing together of the grains, and the underlying basal limestone, where exposed at the surface, shows weathered outlines of fossil shells. I don't know of any lode or vein deposit that shows those unaltered conditions.

Q. The rocks below and above this deposit are clear and distinct from the phosphate beds, are they not?

A. Yes, sir.

Q. And your idea is that these wall rocks must be altered in character, especially close or next to the deposit, in order to constitute a vein?

A. They almost invariably are, in a lode or vein deposit.

Q. Is it necessary that they should be?

A. It is to my mind necessary that they should be changed from the original sedimentation forming the walls or veins."

Summing up the claims of Mr. Weeks and other witnesses for appellee, why the zone of phosphate-bearing rock is not a lode or vein, they are: (1) non-metallic mineral; (2) because it is the original deposition of the material in the place in which it was found; (3) because not formed as veins and lodes are ordinarily formed, and (4) wanting in some characteristics common to many veins and lodes.

There is nothing in any of the several claims of appellee that changes the status of this mineral deposit from being lawfully acquired as a lode location under Sec. 2320, U. S. Rev. Stat.

The problems of the origin and formation of such mineral deposits are complex. Numerous theories have been advanced, but it remains one of

mystery. Discussions would seem to be profitless here since there are no legal questions in connection therewith.

To this claim the author, in Note 1, p. 510, 1st Lindley on Mines (2d Ed.) says:

“The acts of congress are so construed as to include in the category of lodes, veins, and ledges certain deposits which would not fall under the above definition. As, for example, certain tilted beds or sedimentary strata containing ores as original constituents, and not formed by subsequent fissuring and mineralization. The geologist would call these beds, and not lodes, but we understand that the intent of the law is not to make distinctions based upon the genetic principle. It is doubtless true that a very small percentage of the ore deposits of the precious metals occur as tilted beds in place, unassociated with subsequent fissuring and mineralization; but when such are found, they are undoubtedly subject to location as veins or lodes within the meaning of the statutes.”

In *Stevens vs. Williams*, 1 Morr. Min. R., 557, 559, Federal Cases, Vol. 23, No. 13414, Judge Hallett says:

“As to the word **vein** or **lode**, it seems to me that these words may embrace any description

of deposit which is so situated in the general mass of the country, whether it is described in one way or another; that is to say, whether in the language of the geologist, we say that it is a bed, or a segregated vein, or gash vein, or true fissure vein, or merely a deposit; \* \* \* whenever a miner finds a valuable mineral deposit in the body of the earth, as I have described it, he calls that a lode, whatever its form may be, and however it may be situated, and whatever its extent in the body of the earth. The books make some distinctions between beds and lodes, and they make distinctions in the different classes of veins \* \* \* **but these distinctions are not important in relation to this matter of the discovery and taking of these mineral deposits.** It has been decided that congress, in passing this act, intended by this description to embrace and include all forms of deposit which are located in the general mass of the mountain, by whatever name they may be known, and the distinctions which are adopted by geologists in respect to the different kinds of veins are not important except for one question and for one purpose, which I may invite your attention to further on. So that we may say, gentlemen, with respect to the case which is now before you, that, whether this may be called a true vein or a contact vein, or a bed; whether it lies with the stratification or transversely to it, the mat-

ter is of no importance for the purpose of determining this question; it is in any event a lode, if it lies in place, within the meaning of this act. And it is in place if it is inclosed and embraced in the general mass of the mountain, and fixed and immovable in that position."

In *Jones vs. Prospect M. T. Co.*, 21 Nev., 339, 351, the court says:

"The manner in which mineral was deposited in the places where it is found is, at the best, but little more than a matter of mere speculation, and to attempt to draw a distinction based upon the mode or manner or time of its deposit would be utterly impracticable and useless. The question was long ago settled by the courts. In *Stevens vs. Williams*, 1 Morr. Min. R. 557, Hallett, J., said: 'And when this act speaks of veins or lodes in place, it means such as lie in a fixed position in the general mass of country rock, or in the general mass of the mountain. As distinguished from the country rock, this superficial deposit may have been brought into its present position by the elements; may have been washed down from above, or may have come there as aluvium or diluvium, from a considerable distance. Now, whenever we find a vein or lode in this general mass of country rock, we may be permitted to say that it is in place, as distinguished from the superficial deposit, and that is true whatever the character of the



deposit may be \* \* \* It is in place if it is held in the embrace, is enclosed by the general mass of the country.'

"Upon the second trial of the same case (Id. 569), Justice Miller said: 'And there I want to say that by rock in place I do not mean merely hard rock, merely quartz rock, but any combination of rock, broken up, mixed up with minerals and other things, is rock within the meaning of the statute.' And again, in *Mining Company vs. Cheesman*, 116 U. S., 529, 537, the court said: 'Excluding the waste, slide or debris on the surface of the mountain, all things in the mass of the mountain are in place.' (See also, the same case in the circuit court, 2 McCrary, 191; *Hyman vs. Wheeler*, 29 Fed. Rep. 353; *Cheesman vs. Shreeve*, 40 Fed. Rep. 787)."

In *Hyman vs. Wheeler*, 29 Fed., 347, 353, and *Cheesman vs. Shreeve*, 40 Fed., 787, 795, it is laid down:

"With ore in mass and position in the body of the mountain, no other fact is required to prove the existence of a lode or the dimensions of the ore. As far as it prevails, the ore is a lode; and it is not at all necessary to decide any question of fissures, contacts, selvages, slickensides, or other marks of distinction, in order to establish its character."

The legal conclusion will be found clearly and accurately summed up in Martin's Mining Law, Sec. 55, as follows:

“UPON AN ISSUE TOUCHING THE EXISTENCE OF A LODGE OR VEIN at a given place, a question whether there exists one characteristic usually attending the existence of such lode, or another, is a part only of the main question, and, in the presence of other unquestioned elements establishing its existence as a lode or vein, the presence of such characteristics becomes immaterial. For instance, if ore exists in mass and position in the body of a mountain no other fact is required to prove the existence of a lode of the dimensions of the ore so found in mass and position; as far as it so prevails, it is a lode, whatever may be its form or structure, and it is unnecessary to inquire as to or to decide any question of the existence of a fissure, a contact, selvages, or other marks which usually attend the existence of a lode. An impregnation, to the extent to which it may be traced as a body of ore, is as fully within the terms of the act of congress as any other form of deposit, whether it be in the form of a broken mass of limestone, between regular walls of the same rocks, or a part of such strata in solid formations mineralized by the replacement of some of their constituent parts with valuable metals, the result is the same. The existence

of a lode cannot be determined by classifying it as a segregated or contact fissure-vein, or as a bed of ore; or by ascertaining whether the ore is separated from the country-rock by planes or strata visible to the eye."

The settled, practical and sensible construction placed upon the congressional acts for determining to which of the two classes of mineral deposits a given valuable mineral deposit belongs and can be legally acquired is emphasized by a perusal of the testimony of Mr. Weeks, the principal witness for the appellant, and reflects the wisdom of the rule established.

By that rule, a knowledge of the many complex theories and conjectures in respect to the origin and time of occurrence of a valuable mineral deposit; of the nature and mode of aggregation of its mineral contents; of the exact and profound science in relation to the chemical analysis and composition of geological formations; of criteria based on comparisons with characteristics common to many veins or lodes; of the name by which it is called by geologists or others; of the uses to which the mineral may be applied; etc., etc., are each and all excluded and eliminated.

By that rule, the criterion primarily is the **form** in which the valuable deposit is found. If in rock in place in the mass of the mountains, i. e., within defined boundaries, it can be legally acquired **only** by means of a lode location; if, on the contrary, the

valuable deposit is not in rock in place, but is a loose deposit of mineral upon or near the surface, then such deposit can be legally acquired only by means of placer locations embracing the ground upon or within which the same is found.

## ORIGIN.

If, however, the question of origin is deemed material, we are compelled to disagree in toto with the theory set forth in appellant's brief.

The testimony bearing upon the question of origin was exclusively given by the appellant's witness, Mr. Weeks (before referred to), and Mr. Breger, a young man 26 years of age, who said he became a professional geologist in 1903, at the age of 19 years, afterwards graduated at Cornell in 1906, at the age of 23 years. He was connected intermittently with the Geological Survey from 1903-5, and practically continuously thereafter until he became connected with the Mining World in December, 1910. (Rec. 663, 688-690.) He had visited the Rocky Mountain country twice, first in the summer of 1909, and again in 1910. He prepared a report on "The Salt Resources of Idaho and Wyoming," also with Mr. Gale and Mr. Richards he participated in the preparation of a report on the phosphate deposits, and in writing it in part, which report he produced, being Official Bulletin 430-H. U. S. Geological Survey. (Rec. 691-2.)

Briefly epitomized from the testimony in this case, the data relating to this point is as follows:

Phosphorite, the particular ore of phosphorus dealt with in this case, is by standard authorities a massive variety of apatite of various physical characteristics. (Rec. 609.)

Dana, in his great work "A System of Mineralogy" (page 762), so defines it.

On page 764 he states, "Ordinary apatite is fluor-apatite containing fluorine, often with only a trace of chlorine."

When shown the statement in Encyclopedia Britanica, Vol. 18, Ed. of 1898, pages 817, et seq., the witness, Mr. Weeks (Rec. 658-9), testified:

"I have never seen this statement before, but—

Q. You find it there, do you?

A. Yes, sir.

Q. What is phosphorites?

A. The plural of phosphorite?

Q. Phosphorite?

A. Why, it is a chrystalline variety of the mineral apatite, of fibrous structure, containing chlorine (fluorine?).

Q. I read you this short definition from page 818 of this same work: 'Phosphorite is the name given to many impure forms of amorphous or massive apatite, modified more or less by disintegration. It occurs in massive, irregular, corroded looking nodules embedded in limestone or other kind of soft rock, near Amberg.'



A. I think that is an absolutely incorrect definition of phosphorite.

Q. You don't understand from your testimony given yesterday phosphorite to mean what I have just read?

A. No, sir, I don't understand it to mean that."

The appellant's testimony in regard to the chemical character of phosphorite ore is so at variance with the facts that special attention is called to it. In the record, at page 545, Mr. Weeks states that phosphorite always contains some proportion of fluorine, and that there is no fluorine in the ore in the deposit in question. In refutation of these statements we find in the record (p. 699) the following table:

# Analysis of Phosphate Rock From Wyoming, Utah and Idaho.

	1.	2.	3.	4.
Insoluble .....	10.00	1.82	9.40	2.62
SiO <sub>2</sub> .....	None.	.30	Not. det.	.46
Al <sub>2</sub> O <sub>3</sub> .....	.89	.50	.90	.97
Fe <sub>2</sub> O <sub>3</sub> .....	.73	.26	.33	.40
MgO .....	.28	.22	.26	.35
CaO .....	45.34	50.97	46.80	48.91
Na <sub>2</sub> O .....	1.10	2.00	2.08	.97
K <sub>2</sub> O .....	.48	.47	.58	.34
H <sub>2</sub> O .....	1.04	.48	.61	1.02
H <sub>2</sub> O + .....	1.14	.57	.75	1.34
TiO <sub>2</sub> .....	None.	None.	None.	None.
CO <sub>2</sub> .....	6.00	1.72	2.14	2.42
P <sub>2</sub> O <sub>5</sub> .....	27.32	36.35	32.05	33.61
SO <sub>3</sub> .....	1.59	2.98	2.34	2.16
F .....	.60	.40	.66	.40
Cl .....	Trace.	Trace.	Trace.	Trace.
Organic matter .....	Not. det.	Not. det.	Not. det.	Not. det.
	96.51	99.04	98.90	95.97

In every sample fluorine was found. Therefore the ore is phosphorite, or massive apatite, and it answers Mr. Weeks' requirement in this respect. As regards the physical features of phosphorite, on which Mr. Weeks lays great stress, we have but to consider the infinite varieties of the mineral lead carbonate, from the chrystalline to the amorphous state to realize how insignificant this distinction is.

Quibbling on fine points of definition is not

important; and we are in this case simply dealing with an ore of phosphorus in a massive form which is properly called phosphorite.

The rich ore in the vein in dispute is generally found as an oolitic layer lying on or near the barren foot wall. Between the rich ore and the barren hanging wall are a number of other layers of phosphorus ore of lower grade, much being of a shaly, amorphous, and earthy character, and not oolitic; and also layers of gangue material. On this point the testimony of Mr. Weeks is as follows: (Rec. 734.)

“Q. Throughout the intervening layers is there found tricalcic phosphate?

A. I think there is some tricalcic phosphate in all the intervening layers.

Q. In all the intervening layers?

A. Yes.

Q. Of some percentage?

A. Yes, sir, I think so.”

We have also on this same point in the testimony of Mr. Breger the table. (Rec. 694.)

## Phosphate Deposits in Idaho, Wyoming and Utah.

### Section of Phosphate and Associated Beds at Hot Springs, Idaho.

Field No. of Specimen		P <sub>2</sub> O <sub>5</sub> .	Equivalent to Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	Thickness	
		Pr. Ct.	Pr. Ct.	Ft.	In.
	Limestone, compact, hard.....			10+	
141-A	Shale, brown, earthy, calcareous....	9.0	19.7	1	6
141-B	Shale, earthy, massive.....	2.0	4.4	2	8
141-C	Phosphate, oolitic, massive, dark gray .....	32.8	71.8	2	2
	Limestone, massive stratum .....			2	2
141-D	Phosphate, medium to coarsely oolitic, dark gray .....	32.3	70.7		11
141-E	Shale, brownish, earthy, calcareous..	3.5	7.7	1	
141-F	Phosphate, medium grained, oolitic dark gray .....	36.3	79.5	1	3
141-G	Phosphate In.				
	(a) Shale, calcareous .....	5			
	(b) Phosphate, oolitic, brownish. 4	27.5	60.2	1	10
	(c) Shale, brownish phosphatic.. 2				
	(d) Shale, brownish phosphatic.. 11				
141-H	Phosphate, medium to coarse grained Oolitic (main entry tunnel).....	29.1	63.7	5	10
141-I	Phosphate, medium to coarse grained including pebbly texture.....	28.0	61.3	1	5
141-K	Shale, phosphatic, dark brown, earthy .....	24.3	53.2	11	
	Limestone .....			1	
141-L	Shale, phosphate, dark brown, earthy	12.9	28.3+	10	6
	Shale, phosphate, dark brown, earthy			4	11
141-M	Shale, phosphatic, somewhat oolitic.	20.3	44.5	1	8
141-N	Shale, phosphatic, dark brown, earthy	5.2	11.4	4	6
				64	4

To further substantiate our position in regard to this matter, we give the following references to the record.

Record, page 623, from page 356, Vol. 47, of "A Treatise on Metamorphism by Prof. C. R. Van Hise."

“Occurrence—Apatite is one of the most wide-spread, if not the most wide-spread, of all the subordinate constituents of rocks. It is a common, if not an almost universal, constituent of the plutonic rocks, occurs almost as broadly in the volcanic rocks, and is found in many varieties of unaltered or little altered, sedimentary rocks, such as limestone, shales, sandstones, etc.; and, finally, it is almost everywhere found in the metamorphosed, igneous, and sedimentary rocks.”

Record, page 580:

“Q. Mr. Weeks, how does this compare—how does this phosphate rock compare, so far as its oolitic structure is concerned, with limestone deposits?

A. There are very many beds of limestone which are formed of oolites in the same way that I have described the formation of these oolites, and they show in thin sections the same structure as the oolites of the phosphate beds. The oolites of the limestones are calcium carbonate; and the oolites of the phosphate bed are calcium phosphate.”

Record, p. 622:

“Also the moderately strong acids  $\text{H}_2\text{SO}_3$ , and  $\text{H}_3\text{PO}_4$  are not abundant, although phosphoric acid is rather widespread.”

Record, p. 624:

“The depletion of the surface rocks in apa-



tite would seem to furnish an adequate source for the apatite in veins, this mineral being taken into solution near the surface and redeposited deeper down, thus being transported from the belt of weathering to the belt of cementation."

Record, p. 626:

"The general principle applicable to most cases appears to be that the phosphates are dissolved by descending waters in the belt of weathering and thrown down on reaching the belt of cementation. Usually the latter reaction takes place in the upper part of the belt of cementation, so that the phosphates are segregated at or just below the level of ground water. The precipitation of the phosphates is especially likely to occur in limestone."

Record, p. 628-9, Mr. Weeks further testified:

"Q. The question I am trying to get an answer to is this: whether or not there are not different theories as to the origin of the phosphate beds?

A. That is true, because the different beds of phosphate have a different origin and mode of formation. That is the reason that makes the difference in the ideas as to their formation.

Q. Then there is a difference?

A. Yes, sir."

Record, p. 699, et seq., Mr. Breger testified:

"I call your attention to page 7 of this report and bulletin of the government, and under the heading 'Source of Phosphoric Acid,' it is stated: 'An entirely satisfactory explanation has not yet been given of the source or manner of accumulation of the phosphoric acid'—is it not?

A. Yes, it is so stated there. I would lay emphasis on that, if I may, that at the time—

Q. Well, never mind. Your counsel will ask you if there is anything to emphasize—after a while. I next call your attention to the following, found on page 22 of this report, where it is said: 'The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales. They consist of very dense, compact, fine grained limestone, having a foetid odor when struck with a hammer, but showing a low percentage of phosphoric acid whenever tested, as all the dense, fine grained limestone tested we found to run very low in phosphoric acid, tests of these rocks were abandoned in the latter part of the season's work.' That is the fact, as the examination of your party up there showed that summer?

A. No, sir.

Q. Is it not?

A. Except 'The occurrence of rounded or oval limestone nodules, ranging from a few inches to several feet in diameter, is a characteristic feature in the phosphate beds and the phosphatic shales'

should be modified to mean the phosphatic beds and all the phosphatic shales other than the principal phosphate beds.

Q. Why didn't you modify it when you went over this report?

A. I didn't write that; and besides, that is a very minor and technical point, that there were so many divergent—

Q. You assisted, you stated, in the preparation of the work, and in the preparation of this report?

A. Yes, sir.

Q. And now you want to qualify it?

A. I have no responsibility for that report myself. My name does not appear in the authors.

Q. Did you suggest it being changed at the time?

A. No, sir; the point didn't occur to me at the time."

Again (Rec. 706-7), we find the following:

"Q. On page 63 I find the following: 'The most massive or less shaly material and that most coarsely oolitic is considered the best ore. The rock of the workable bed is dark gray when freshly taken out, drying to a light gray in the air. It is of fine to medium and in part coarsely oolitic texture, and shows both massive and shaly structures.'

A. May I refer back to what that refers to?

Q. Sure?

A. Yes. This word 'ore' here is used in a general and very loose sense, and not at all in a technical sense; besides which, I remember that this statement was given to us by some of the men on the ground. The fact that the miners consider the shaly material, or the most coarsely oolitic, the best ore, is not determined primarily by the geologists, but they took the word of the men there, and there was nothing to contradict that. The word 'ore,' as a matter of fact, is used very loosely there."

From all the above, we conclude that a rational theory for the origin of this ore is that the phosphoric acid and phosphates, leached from the rocks above, by underground waters, and, reaching the favorable beds of oolitic limestones and shales (which now form the vein or lode in dispute, and which had a selective action for the phosphates), mineralized them by the simple interchange of bases (metasomatic action) between the phosphates and the carbonate of lime. We know this to be true of many ore bodies.

The denial of this theory of origin by the principal witness of the appellant, Mr. Weeks, should have no weight with the court owing to the woeful lack of chemical knowledge displayed by this witness. He says  $P_2O_5$  (phosphorus pentoxide) is phosphoric acid. Phosphoric acid is  $H_3PO_4$ . He states  $H_3PO_4$  is not carried in solution. It is so carried. He says arsenic and antimony are non-metals. They

are both metals. He does not know the composition of galena and calls cube galena the metallic form of lead. (Rec. pp. 732, 747, 748.)

Mr. Breger's testimony lacks the ring of sincerity when the origin of the ore is considered. His wholesale denial of the carefully prepared government report when in his opinion it would conflict with the interests of the appellee is a sufficient comment on the value of his testimony in this line.

The position we have taken with respect to the origin of this vein or lode of phosphorus ore is confirmed by such eminent authorities as—

Dr. Thomas Sterry Hunt, in his *Chemical and Geological Essays* (4th Ed.), page 222.

The learned author says:

“Ordinary soils contain only a few thousandths of this element, yet there are agencies at work in nature which gather this diffused phosphorus together in beds of mineral phosphates and in veins of crystalline apatite, which are now sought to enrich impoverished soils.”

## USES OF PHOSPHORUS.

Appellee claims calcium phosphate is used as a fertilizer and for no other purpose. Mr. Weeks (Rec. 545), testifies:

“Q. What is this calcium phosphate mined for?



A. For its use as a fertilizer to enrich the ground.

Q. And is that the only use to which it is put at this time?

A. Yes, sir.

Q. And for what constituents that it contains is it valuable?

A. Calcium phosphate."

In refutation of this statement and to fully understand the many uses to which phosphorus, the valuable constituent of calcium phosphate, is applied, we have but to read the testimony of the same witness on cross-examination. (Rec. p. 658-661):

"Q. It is the combination of phosphoric acid and tricalcic, or lime, that gives it commercial value, is it not?

A. Yes, sir.

Q. Without that union or combination these deposits in question would not have commercial value?

A. No, sir.

Q. And that combination of the mineral is in the Encyclopedia Britanica under Phosphorite, is it not?

A. I don't think so. It is the chemical compound of calcium phosphate and phosphoric acid—it should be.

Q. Isn't there such a thing known as metallic phosphorus?

A. I don't know of any such a thing.

Q. You never heard of it?

A. I don't recall it.

Q. I call your attention to the Encyclopedia Britanica, Volume 18, Edition of 1898, page 817, which I wish you would look at, and then answer the question if there is any such a thing known as metallic phosphorus?

(The witness examined the same.)

A. I have never seen this statement before, but—

Q. You find it there, do you?

A. Yes, sir.

Q. You find it there?

A. Yes, sir.

Q. What is phosphor bronze?

A. I don't know.

Q. You have never heard of that, have you?

A. Oh, I have heard it, but I don't know it.

Q. This encyclopedia, at page 817, under that heading, says: 'This name has been given to a class of useful metallic substances produced by the chemical union of either pure copper or of copper alloys with phosphorus.' That is entirely new to you?

A. I think so. I don't recall it under that name.

Q. I will ask you what is meant by the chemical formula,  $P_2O_5$ ?

A. Phosphoric acid.

Q. And what?

A. Phosphoric acid. That is the chemical formula for phosphoric acid?

Q.  $P_2O_5$ ?

A. Yes, sir.

Q. That means two parts—

A. —of phosphorus—

Q. —and five of—

A. —of oxygen.

Q. Now, you have testified about the uses and the use of this material found in these deposits?

A. Yes, sir.

Q. When did you visit the factories?

A. On June 15th, 1911.

Q. Where?

A. At Martinas, California.

Q. Well, whose building?

A. The factory of the San Francisco Chemical Company.

Q. I read you now from page 815 of the same encyclopedia, under the heading, 'Manufacture:' 'For the manufacture of ordinary phosphorus any kind of phosphate of lime might be used, and in fact, mineral phosphates are used occasionally.' Is that the fact, as you understand it?

A. Yes, sir, as I understand it.

Q. 'Although bones are often resorted to?'

A. Yes, sir.

Q. This deposit could be used in that way?

A. I think so.

Q. You really know that, don't you?

(No answer.)

Q. You really know that?

A. That it could be used?

Q. Yes?

A. Oh, yes.

Q. Now, the use is in some of the arts and industries, and in the medica materia?

A. Yes, sir." (Rec. 661.)

We believe this is sufficient to show to the court that the phosphorus in this ore is the real valuable constituent for a great many purposes.

## CONCLUSION.

That the deposit is a vein or lode when considered under the Act of Congress as construed by the courts, is clear and undoubted. The witnesses for appellee do not contend that the mineral deposit is a placer (Rec. 687, 604), their only claim is that it is **not** a vein or lodè as understood by geologists. The scientific and technical definitions of the term "lode" or "vein" by geologists and lexicographers were long ago discarded by the courts in construing the Congressional mining Acts, and a broad construction applied to the term "vein" or "lode." Eureka case, 4 Saw., 302, when Mr. Justice Field decided that the term "lode" as used in the Acts of Congress is applicable to any zone or belt of mineralized rock lying within boundaries clearly separating it from the neighboring rock.

Appellants in making and maintaining their lode locations have done only that which the law permits and in a manner authorized by law. On the other hand the acts of appellee are not commendable. It is seeking to obtain title to the mineral deposit for one-half of the government price. It had notice long ago when the Waterloo placer patent issued, simply upon ex parte hearing, that the deposit "might without serious objection be located and patented as lodes" and that when that patent issued it was specifically stated that it "was not to be considered as an established precedent." If the appellee had any honest doubt as to whether the deposit might be legally located and acquired as lodes or as placer, it had the option to maintain, not only its placers but the old lode locations; and this too, undoubtedly, at the same annual expense. That option was capriciously ignored until it was too late.

We respectfully submit that the decree appealed from should be reversed and that a decree be directed to be entered in favor of the appellants for the conflict area as prayed for in their amended bill of complaint.

A. B. GOUGH,  
A. L. HOPPAUGH,  
C. B. JACK, and  
CHARLES C. DEY,  
Counsel for Appellants.



## APPENDIX.

SECRETARY'S OFFICE  
DEPARTMENT OF THE INTERIOR.

In re  
HARRY LODGE MINING  
CLAIM.

Dec. 7, 1912.

"N"

N. E. 01635

Salt Lake City, Utah.

Instructions.

The Commissioner of the General  
Land Office.

Sir: The Department is in receipt of your letter of February 19, 1912, submitting for instructions, pursuant to departmental order of June 30, 1910, the matter of mineral entry 01635, made August 31, 1909, for the Harry Lodge mining claim, situate in the E.  $\frac{1}{2}$  Sec. 7; W.  $\frac{1}{2}$  Sec. 8, T. 11 N., R. 8 E., S. L. B. M., Salt Lake City, Utah.

This claim was located October 31, 1907, by M. S. Duffield, et al, the present entrymen, on account of a deposit of rock phosphate disclosed therein. Subsequently to such location and on December 9, 1908, the township wherein the claim is situated, was, by departmental order of that date withdrawn from all forms of location and disposal, subject, however, to valid existing rights. By executive

order of July 1, 1910, the said departmental order of withdrawal was, in so far as it included lands described in said executive order—ratified, confirmed, and continued in full force and effect; and subject to all of the provisions, limitations, exceptions and conditions contained in the Act of Congress entitled “An Act to authorize the President of the United States to make withdrawals of public lands in certain cases,” approved June 25, 1910, there is hereby withdrawn from settlement, location, sale, or entry and reserved for classification and in aid of legislation affecting the use and disposal of the phosphate lands belonging to the United States, all those certain lands of the United States set forth and particularly described as follows, to wit:

T. 11 N., R. 8 E., Secs. 4 to 9 and 16 to 21, inclusive; Secs. 30 and 31.

You report that:

“The application proceedings appear to be regular in all respects, the only question in the case being as to the patentability of the land; and, if patentable, whether as a **lode** claim, as applied for and entered, or under the laws pertaining to **placer** mining claims.”

In the case of Henderson, et al vs. Fulton (35 L. D., 652, 662), it is said:

“It may well be further stated, as a proposition equally supported by the authorities, that the amount of land which may be located as

a vein or lode claim and the amount which may be located as a placer claim, and the price per acre required to be paid to the Government in the two cases when patents are obtained, and the rights conferred by the respective locations and patents, and the conditions upon which such rights are held, differ so materially as to make the question whether mineral lands claimed in any given case belong to one class or to the other, a matter of importance, both to the Government and to the mining claimant. And, it is also true, mineral lands of either class can not be lawfully located and patented except under the provisions of the statute applicable to such class. Veins or lodes may be located and patented only under the law applicable to veins or lodes. Deposits other than veins or lodes are subject to location and patent only under the law applicable to placer claims."

And at page 685 of the same decision, it is said:

"It is apparent, also, that Congress had in mind and fully recognized, what experience had theretofore abundantly shown, that these two classes of mineral deposits are so different in their character and formation, and so completely separate and distinct from each other, that even when found to exist in the same superficial area, they may be located and held by different

persons, and patented accordingly (Sec. 2333). This principle has been recognized and followed in both judicial and departmental decisions (*Reynolds vs. Iron Silver Mining Company*, 116 U. S., 687, 695-7; *Aurora Lode vs. Bulger Hill and Nugget Gulch Placer*, 23 L. D., 95, 99-100; *Daphne Lode Claim*, 32 L. D., 513; *Jaw Bone Lode vs. Damon Placer*, 34 L. D., 72).

To the same effect also is the decision in *E. M. Palmer* (38 L. D., 294). See also *Clipper Mining Company vs. Eli Mining and Land Company* (194 U. S., 220, 228), and *Webb vs. American Asphaltum Mining Company* (157 Fed. Rep., 203, 206).

If, therefore, the deposit, on account of which title to the claim here in question is sought, exists therein in vein or lode formation, the area would be disposable only under the provisions of the lode mining laws. If, on the other hand, it be a placer deposit, and there be no lode within the limits of the claim, the lode laws would have no application, but the land would be subject to entry and patent exclusively under the provisions of the placer mining laws.

The claim is situated in the northern part of what is known as the Crawford Mountain area. The record in this particular case does not present such a description of the deposit as would enable the Department to intelligently determine its precise character. The claim, however, is shown to adjoin,

on its northerly end, the southerly end of the patented Lorine lode mining claim, and to be laid along a southerly extension of the outcrop of the same deposit, which, in a report filed in connection with the Lorine patent proceeding, was described by the mineral surveyor, who surveyed the latter claim. This description, which is deemed by the Department to sufficiently establish the character of the deposit disclosed on this claim, is as follows:

“The said deposit consists of a series of bedded veins of rock containing varying proportions of calcic phosphate. The individual veins of the series of veins vary in thickness from a few inches to ten or twelve feet. Only a portion of the veins contain rock sufficiently rich in calcic phosphate to be of commercial value, and only a portion of the veins are thick enough to be profitably mined, even when the contained proportion of calcic phosphate is sufficiently high. \* \* \* Physically, the higher grade vein rock occurring in the veins of the Lorine lode location is hard, its color is a grayish, bluish black. It is homogeneous in appearance, and is composed of small oolitic rounded grains cemented together by an extremely thin film of calcite and silica. \* \* \* Taken as a whole, the above mentioned series of bedded veins of phosphate rock and also each of the individual or separate veins of the series lies between, is conformable to, and is bounded by walls of rock, which wall rock is generally lime-



stone, but often is a very siliceous or cherty limestone, or a soft sandstone, or a shale or quartzite."

Here follows a sectional description of the phosphate beds disclosed in the tunnel on the claim:

"From the position of the hanging wall of the series of veins as exposed in the Lorine tunnel, the indications on the surface along the apex of the veins and the prominently outcropping footwall formation west of the mouth of the Lorine tunnel, I estimate the thickness of the series of veins, taken as a whole, from the contact of the easternmost vein of the series of veins with its hanging wall, to the contact of the westernmost vein of the series with its footwall, to be approximately 110 feet.

"As shown in the above descriptions, the individual veins of the series of veins of phosphate rock which exist in the Lorine lode locations, are separated from each other by strata of limestone, chert or shale. These separating strata vary in thickness from less than an inch to several feet. Taken as a whole, the series of veins lies between and is clearly limited and defined in extent and position by solid massive walls of hard siliceous limestone. Within the series of veins the separating strata limit and define the extent and position of the corresponding individual veins of the series, and are the walls of these individual veins. The strike and dip

of the veins and walls conform to each other throughout their entire extent within the Lorine lode location. I thus find that taken separately or as a series, that is, as a whole, the veins are obviously in place between walls, have a well defined dip, and strike and are an essential part of the mountain upon which the Lorine lode location is located."

This and co-related deposits in Bear Lake County, Idaho; Uintah County, Wyoming, and Rich, Weber and Morgan Counties, Utah, were in 1909 examined by Messrs. Hoyt S. Gale and Ralph W. Richards, geologists of the United States Geological Survey, the results of which examinations are given in Bulletin No. 430. As described by those gentlemen, the formations and the phosphate-bearing member thereof do not differ in any substantial particular from the formations and deposit existing upon the Lorine claim described by the mineral surveyor thereof.

Sections 2320 to 2328 of the Revised Statutes make certain provisions for the locating, working, holding and purchase of mining claims "upon veins or lodes of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits." Sections 2329 to 2331 provide that claims usually called "placer," including all forms of deposit, excepting veins of quartz, or other rock in place, shall be subject to entry and patent under like circumstances and conditions and upon

similar proceedings, as are provided for vein or lode claims, but with wholly different provisions as to extra-lateral rights, area, survey, and price to be paid for the land.

If, therefore, the deposit here in question, which undoubtedly contains a valuable mineral substance, answers the description of a vein or lode of quartz or other rock in place, it is subject to disposition exclusively under the provisions of the lode land law. If not, then the placer laws alone are operative.

In the case of *Iron Silver Mining Company vs. Cheesman* (116 U. S., 529), the Supreme Court, page 533, said:

“What constitutes a lode or vein of mineral matter has been no easy thing to define. In this court no clear definition has been given. On the Circuit it has often been attempted. Mr. Justice Field, in the *Eureka* case (4 Sawyer, 302, 311), shows that the word is not always used in the same sense by scientific works on geology and mineralogy as by those engaged in the actual working of mines.”

After setting forth the court's definition in the *Eureka* case, the court says:

“This definition has received repeated commendation in other cases, especially in *Stevens vs. Williams* (1 McCrary 480, 488), where a shorter definition by Judge Hallett of the Colorado Circuit Court, is also approved, to wit:

‘In general, it may be said, that a lode or vein is a body of mineral or mineral body of rock, within defined boundaries, in the general mass of the mountain.’

In *Hays, et al, vs. Lavagnino* (53 Pac., 1029), it is held (Syllabus) that:

“In practical mining, the terms ‘vein’ and ‘lode’ apply to all deposits of mineralized matter within any zone or belt of mineralized rock separated from the neighboring rock by well defined boundaries, and the discoverer of such a deposit may locate it as a vein or lode. In this sense, these terms were employed in the several acts of Congress relating to mining location.”

In *Beale vs. Cone* (62 Pac., 948, 953), it is said:

“The controlling characteristic of a vein is a continuous body of mineral-bearing rock in place, in the general mass of the surrounding formation. If it possess these requisites and carry mineral in appreciable quantities, it is a mineral-bearing vein, within the meaning of the law, even though its boundaries may not have been ascertained.”

In the case of the *United States Mining Company vs. Lawson* (134 Fed. Rep., 769), which was affirmed by the Supreme Court (207 U. S., 1), it was held that a broken, altered, and mineralized zone of limestone lying between walls of quartzite

constituted a lode or vein within the meaning of the mining laws.

In *Duggan vs. Davey* (26 N. W., 887), a deposit of mineralized quartzite, a formation of purely sedimentary origin, about ten feet in thickness, inclosed between a stratum of limestone and a separate and distinct bed of quartzite, and having a dip of about 8 degrees, was regarded by the court as a lode or vein within the meaning of the mining laws.

In the case of *E. M. Palmer*, *supra*, the Department had before it for determination the question as to whether a deposit of sandstone shown to carry gold, which had been located under the placer mining laws, was a lode or placer formation. The Department, in that case, at page 297, said:

“From the reasoning of the authorities cited, it follows that sand-rock or sedimentary sandstone formation in the general mass of the mountain bearing gold, such as is here disclosed by the evidence, is rock in place bearing mineral and constitutes a vein or lode within the purview of the statute, and can be located and entered only under the law applicable to lode deposits. The Department is convinced that the deposit described in the testimony in this case falls well within the category of lode deposits under the mining statutes, and that such a deposit cannot lawfully be appropriated or patented under those portions of the statutes which apply to placer claims.”



The mineral-bearing sedimentary deposits, held in the cases above cited to be lodes or veins within the meaning of the mining laws, were valuable on account of the metallic minerals therein contained. In *Webb vs. American Asphaltum Mining Company*, *supra*, decided in 1907, it was, however, held, in substance, that the clause "other valuable deposits," used in section 2320, Revised Statutes, includes non-metalliferous as well as metalliferous deposits, and hence that a deposit of asphaltum in lodes or veins in rock in place may be entered and patented under section 2320, and may not be secured by means of placer claims under section 2328, nor the act of February 11, 1897, (29 Stat., 526), regarding the entry of lands containing petroleum and other mineral oils. Citing and following this decision, the Department, in the case of *Utah Onyx Development Company* (38 L. D., 504), held that valuable deposits of onyx occurring in well-defined fissures, with clearly marked hanging and foot walls of limestone, are subject to appropriation only under the lode mining laws. In the earlier case of *Henderson, et al, vs. Fulton*, *supra*, the Department said, at page 663:

"Some of the authorities hold the view that only minerals of the metallic class are within the statutes relating to veins or lodes, but the great weight of authority is the other way; and the Department is of opinion that the latter is the better view. That the statute is broad enough to embrace minerals of the non-

metallic as well as the metallic class, wherever found in rock in place, was distinctly held after careful consideration and full discussion in the case of Pacific Coast Marble Company vs. Northern Pacific Railroad Company (25 L. D., 233, 241, 243.) See also Lindley on Mines, Secs. 86, 323; 1 Snyder on Mines, Sec. 337.)

It is immaterial, therefore, whether a deposit bear minerals of a metallic or non-metallic nature; if a mineral deposit exist in vein or lode formation—that is to say, if it be in place in the general mass of the mountain, it is, whether the mineral it bears be metallic or non-metallic, subject to disposition only under the provisions of the lode mining laws.

From the foregoing, it is clear to the Department that a deposit of phosphate rock, such as that herein-above described, confined, as it is shown to be, between well defined boundaries, constitutes a lode or vein of mineral-bearing rock in place within the general mass of the mountain, and hence is subject to disposition only under the provisions of the lode mining laws.

This location, so far as the record discloses, was made in entire good faith, and there is no suggestion of anything that might in any wise invalidate the claim, the location, and, in fact, the entry, having been made before the executive withdrawal of July 1, 1910.

In the absence of other objection, therefore, the claim will be passed to patent as located and entered.

Very respectfully,

(Signed) SAMUEL ADAMS,

First Assistant Secretary.

## IN RE LORINE LODE MINING CLAIM.

### MEMORANDUM.

The subject under consideration is whether the so-called veins or lodes included within the locations hereinafter described possess the elements of rock in place bearing one or more of the minerals specified in section 2320, United States Revised Statutes, or some other mineral that would be embraced within the added words "other valuable deposits."

September 13, 1905, Charles C. Jones located what is described as the Lorine lode, situated in Sec. 8, T. 11 N., R. 8 E., S. L. M., Rich County, Utah.

In the location certificate thereof it is recited that said location was made upon a "bedded vein or deposit of phosphate rock in place."

June 19, 1907, the Bradley Brothers, being then the owners of said Lorine lode, filed in the Salt Lake City (Utah) land office their application for patent for said claim, and after the usual proceedings as to the notice, etc., as required by the statutes of the United States relating to the patenting of lode min-

ing claims, said Bradley Brothers on October 24, 1907, made mineral entry 3923 for their said Lorine lode mining claim. The records of this mineral entry disclose the fact to be that at no time prior to the time when entry was made as aforesaid for this claim was there ever filed any protest or adverse claim against the premises included within this entry.

In a letter dated January 11, 1908, this office directed the local officers to notify the entrymen to have the surveyor who made the survey of the claim submit a verified report, certified by the United States surveyor-general of Utah, showing the nature of the deposit, its formation, and mode of occurrence.

Following this letter there was filed in the local office on the 23d of March last, a corroborated protest of the San Francisco Chemical Company, protesting against the issuance of patent to said Bradley Brothers for said Lorine lode, under the laws relating to lode mining claims.

In a general way the protest sets forth, first, that the deposits embraced within the exterior boundaries of the Lorine lode mining claim are placer in character and are not veins of quartz or other rock in place; protestants further say that they are interested in the subject-matter of the determination and classification of the valuable deposits embraced in the aforesaid lode mining claim, for the reason, principally, that they have made certain placer locations within the same locality where the

said Lorine lode claim is located. Protestants further state in said protest that they are already owners of a certain placer known as the Waterloo placer, whose geological formation is identical with that included within the boundaries of said Lorine lode. They call attention to the fact that prior to the time patent was issued for the said Waterloo placer, a memorandum was written respecting the formation of deposit included within its exterior limits, and that in said memorandum said deposits were regarded as coming within the purview of the laws regarding placer claims, and they ask that a similar ruling be made with respect to the deposits within the said Lorine mining claim.

March 24, 1908, the local officers forwarded the aforesaid protest, and in their letter of transmittal stated that in view of the allegations made by the protestant they would respectfully recommend that a hearing be ordered to determine the character of the land involved, as to whether same is lode or placer.

Neither the protestant nor the protestees have asked for a hearing, and it is not thought necessary to order one, in view of the large expense to which the parties may be involved therein, and for the further reason that it is believed that sufficient data are before the writer to enable him to determine intelligently whether the Lorine lode mining claim may be approved for patent as a lode mining claim or otherwise.



In addition to certain plats connected with the Waterloo claim, the only evidence submitted by the protestant consists of transcripts of certain testimony submitted in June and September, 1905, before a certain examiner in connection with an adverse suit of Charles C. Jones against William S. Goodfellow and others, removed to the United States circuit court for the ninth district, in and for the district of Idaho, southern division, and involving an adverse claim filed by the lode claimant against the said Waterloo placer.

The testimony set forth in said transcripts has been heretofore gone over very carefully, and epitomized in office memorandum of December 12, 1905, approved by the honorable commissioner, W. A. Richards, under date of December 27, 1905.

An examination of the protest shows that the protestant alleges no surface conflicts with the ground entered under the Lorine lode mining claim, and, further, said protest shows that the protestant does not allege or claim any adverse interest in the ground involved in said Lorine lode entry. With regard to this protest, and particularly so much thereof as refers to the said Waterloo placer, it is to be observed that the formation of the deposit contained within the said Waterloo placer is not now under consideration, and, further, that when it was under consideration it was specifically stated in said office memorandum of December, 1905, that while the deposit covered by the Waterloo might, without serious objection, be located and patented

as lodes, it was perhaps better to consider them as placer deposits, thus conforming to the view of geologists. It may be stated in this connection that at and long prior to the time of the preparation of said memorandum of December 12, 1905, all of the entries for lands embracing phosphate deposits related to placer locations, and, further, that at the time of the entry of the land included within the said Waterloo placer limits there was not then existing any protest or adverse claim against the same. In other words, it was specifically stated in said office memorandum that the decision applied only to the Waterloo placer, and was not to be considered as an established precedent.

The Bradley Brothers have also made other mineral entries for mining claims in the locality where the Lorine lode mining claim is situated, viz., mineral entry 3934, for the Shoshone and other lodes, and mineral entry 3932, for the Cherokee and other lodes. It appears also that they have filed in said local land office an application, No. 4272, for the Arickaree and other lodes, also located in the same locality where the Lorine and the above mentioned locations are situated.

The Lorine lode entrymen have also submitted a transcript of the testimony hereinbefore referred to as having been taken in connection with the adverse suit removed to the United States circuit court; besides this they have submitted a transcript of certain testimony which was taken December 20, 1907, at Salt Lake City, Utah, in the matter of the

protest of the State of Utah against said Bradley Brothers, involving the said Arickaree and other lodes.

Besides this the said Bradley Brothers have submitted a plat showing thereon that they have made a number of locations in this vicinity for phosphate lode mining claims, the same being in the shape of two parallel shoestrings, extending for, possibly, 1 or 2 miles.

Numerous photographs also have been submitted depicting the physical conditions in this country and of certain other locations made upon and in behalf of the said Bradley Brothers, and samples of ore alleged to have been taken from these claims have also been submitted.

The Bradley Brothers have also submitted a report made by Mr. Guy Sterling, the mineral surveyor who surveyed their said Lorine lode mining claim, which report is in response to said office letter of March 6, 1908.

The following extracts are taken from said Sterling's report, which have been submitted to sustain the protestees' contention that their said Lorine lode should be patented as a lode-mining claim:

"The said deposit consists of a series of bedded veins of rock containing varying proportions of calcic phosphate. The individual veins of the series of veins vary in thickness from a few inches to 10 or 12 feet. Only a portion of the veins contain rock sufficiently rich in calcic phosphate to be of

commercial value, and only a portion of the veins are thick enough to be profitably mined, even when the contained proportion of calcic phosphate is sufficiently high. \* \* \*

The variety (of calcic phosphate) found in the veins of this lode location is massive in form; that is, uncrystallized (phosphorite). Physically the higher grade vein rock occurring in the veins of the Lorine lode location is hard, its color is grayish bluish black. It is homogeneous in appearance and is composed of small oolitic rounded grains cemented together by an extremely thin film of calcite and silica. \* \* \* Taken as a whole, the above-mentioned series of bedded veins of phosphate rock, and also each of the individual or separate veins of the series lies between, are conformable to and bounded by walls of rock, which wall rock is generally limestone, but often is a very silicious or cherty limestone or a soft sandstone or a shale or quartzite.

Describing the physical conditions appearing in the tunnel, the report further says:

"Beginning at the limestone hanging wall occurring in the face of the Lorine tunnel and going toward the western or foot wall side of the series of veins as far as the formation has been exposed, the walls and veins occur as follows:

"First. Hard siliceous dark blue limestone hanging wall.

"Second. Vein of good grade phosphate rock, dark brown in color, 9 feet thick.

Third. Thin stratum or wall of shale.

"Fourth. Vein of high grade, blue-gray phosphate rock, 4 feet in thickness.

"Fifth. Thin wall of shale.

"Sixth. Vein of good grade, dark-brown phosphate rock, 14 feet thick.

"Seventh. Wall of black chert, practically pure silica, 2 feet thick.

"Eighth. Wall of dark limestone, 4 feet thick.

"Ninth. Vein of blue-gray, high-grade phosphate rock, 2 feet thick.

"Tenth. Wall of yellowish limestone,  $2\frac{1}{2}$  feet thick.

"Eleventh. Vein of blue-gray, high-grade phosphate rock, 8 inches thick.

"Twelfth. Wall of grayish siliceous limestone, three feet thick.

"Thirteenth. Vein of black, good grade phosphate rock, exposed for about 4 feet of its thickness, and foot wall not shown.

"The veins and walls as above described and represented in the above-mentioned sketch conform to each other throughout the portion of the series of veins shown, and have a clearly defined dip of 53 degrees E. and strike of S. 17 degrees W.

"On the surface, immediately above the Lorine tunnel, the position of the veins is indicated by detached pieces of phosphate rock lying on the surface, along and on the apex of the veins. By these indications the course of the veins may be traced from the tunnel through the Lorine lode location,



both southerly to its southerly end line and northerly to its northerly end line.

“The series of veins of phosphate rock existing within the Lorine lode location may be followed by surface indications along the apex of the series of  $2\frac{1}{2}$  miles northerly, and for about 10 miles southerly from the Lorine lode location.

“The most striking features of these surface indications is the frequent prominent and often precipitous outcrop of the hanging and foot wall formation of the series of veins, while between these walls the position of the veins is readily located by the outcropping of individual veins of phosphate rock and by large quantities of detached pieces of the phosphate rock lying on the surface along the apex of the series of veins.

“The line of demarcation between the veins of phosphate rock and their walls of limestone, shale, or chert is sharply defined and distinct. In other words, the vein rock terminates and the wall rock begins abruptly, and the distinction between the phosphate rock of the veins having commercial value due to its contained percentage of phosphorus and the wall rock having no commercial value is readily determined by visual inspection.

“The limestone strata forming the walls of the bedded veins of phosphate rock and the veins themselves are sedimentary in origin, and belong to the Upper Carboniferous formation.

“The existence of the veins of phosphate rock may be accounted for by supposing that a bed of

limestone originally occupied the position of one of the veins of phosphate rock, and that the bed of limestone was covered, while in its original horizontal position with a bed of animal and vegetable remains, shells, excrement, and other material containing free phosphoric acid and soluble phosphate. Water percolating from above through this mass carried the phosphoric acid and soluble phosphates down to the underlying bed of limestone. By the contact of the phosphoric acid and the soluble phosphates with the limestone chemical action was brought about, resulting in the formation of a bed of calcic phosphate, where originally was a bed of limestone. In the course of time other beds of limestone and calcic phosphate were successively and alternately deposited one above the other through the entire series of veins.

“Consolidation and concentration of the beds of calcic phosphate thus formed were brought about by the pressure of subsequently deposited formation. After being continued for an indefinite period this process was followed by a series of uplifting and folding movements which finally brought the veins or beds of phosphate rock and their limestone walls to their present position and condition.”

The facts as regards locations, patent proceedings, etc., of the claims in mineral entries 3932 and 3934 are quite similar to those in said M. E. 3923. So also as respects the protests filed against said mineral entries 3932-3934, and whatever is said in the course of this discussion respecting the

Lorine lode will apply with equal force to the locations included in the other entries referred to herein.

So far as mineralogical and geological conditions are concerned, a similar report has been made by Mr. Sterling with respect to the mining claims in said mineral entries 3932-3934.

The attorney for the Bradley Brothers has submitted a brief in support of their contention that the claims should properly be classified as lode mining claims. In the introductory part of his brief counsel for the entrymen states that in the section of the country where these claims are situated there seems to exist a diversity of opinion among lawyers, acting for proposed locators, as to whether the location in this field should be as lode or as placer locations, from which it might be inferred that it was expected that the decision in the several mineral entries under consideration respecting whether they are lode or placers would forever set at rest the chaotic state of affairs in this regard and make certain that all future phosphate locations in this territory must be made in conformity to the views herein expressed. It is not intended that this opinion shall have any such effect, and it could not have any such effect, even if it were so intended. This opinion is designed to settle nothing but the matter involved in these entries, namely, whether they may be patented as lode-mining claims under section 2320 of the United States Revised Statutes relating to lode-mining claims.

In almost any mineralized section lodes and placers, as understood and defined both by the courts and the land department, will be found frequently in conflict with each other.

The mining laws, section 2333, United States Revised Statutes, recognized this situation and have made provision therefor.

All future entries for mineral lands in this locality will of necessity have to be considered and adjudicated upon the facts found in connection therewith and the law applicable thereto, precisely as is now being done in the case at bar, and as would be done in the courts in any adverse suit wherein was brought in issue the question whether or not the mineral formation in the land in controversy should be adjudged to be lode or placer in character.

The evidence above referred to as having been submitted in the Waterloo adverse case and the report of Mr. Sterling shows that the deposits embraced in the Waterloo placer and in the locations embraced in the entries under consideration are of practically the same geological formation. Skillful witnesses of undoubted integrity have submitted different views respecting the classification of the phosphate deposits in this section of our country. Much that has been testified to by the various witnesses for both sides is of a speculative nature. They have testified, also, to practically the same set of facts, but out of this compound of fact and opinion it is believed that there has been produced sufficient

evidence to show that the locations embraced in these entries may properly be approved for patent as lode mining claims. By section 2318 it is provided that in all cases lands valuable for minerals shall be reserved from sale except as otherwise expressly directed by law, and by section 2319 it is provided that all valuable mineral deposits in lands belonging to the United States are declared to be free and open to exploration and purchase and the lands in which they are found to occupation and purchase by citizens of the United States, etc.

In the case of *Gary vs. Todd*, (18 L. D., 58) it was held by the department that land chiefly valuable for phosphate deposits was mineral in character, and the same view was taken by the department in the later departmental decision reported in 26 L. D., 600, in the case of the *Florida C. & P. R. R. Co.*

Lode claims are referred to in section 2320, United States Revised Statutes, in part as follows:

“Mining claims upon veins or lodes of quartz or other rock in place bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits.”

Placer claims are referred to in the mining laws, section 2329, in the following language:

“Claims usually called placers, including all forms of deposit excepting veins of quartz or other rock in place, shall be subject to entry and patent under like circumstances and conditions and upon similar proceedings as are provided for in vein or lode claims.”



In the case of *Henderson vs. Fulton*, reported in 35 L. D., 663, it was held that the foregoing provisions of the statute were broad enough to embrace minerals of the non-metallic (such as the mineral here under consideration), as well as metallic class, wherever found in rock in place. This view was also taken in the United States circuit court of appeals for the eighth circuit in the case of *Webb vs. American Asphaltum Company*, decided November 16, 1907, concerning a lode or vein of asphaltum of the kind commonly called "gilsonite."

"A lode is in place when it is enclosed and embraced in the general mass of the mountain and fixed and immovable in that position, and it is not material that the vein matter is loose and disintegrated. (*Stephens vs. Williams*, 1 Mor. Mining Rep., 559; *Leadville M. Co. vs. Fitzgerald*, 4 id., 387; *Stephens vs. Murphy*, id.)

"'Country' or 'country rock' is used to designate the surrounding mass of rock in which lodes or veins of mineral are found; *Stephens vs. Williams*, *supra*.

"Cinnabar is not found in any fissure of the earth's crust or in any lode as defined by geologists, but the definition of the term lode must apply to all deposits of all the metals named in the act of congress and includes cinnabar, if it apply to a deposit of any of them. (*Eureka C. M. Co. vs. Richmond M. Co.*, 4 Saw., 311.)

"A lode is any zone or belt of mineralized rock lying within boundaries clearly separating it from

the neighboring rock. It includes all deposits of mineral matter found through a mineralized zone or belt coming from the same source, impressed with the same forms, and appearing to have been created by the same processes. (Field J., *id.* 312; *Diablo M. & M. Co. vs. Callison*, 6 Saw., 444.)

“The vein must be continuous only in the sense that it can be traced by the miner through the surrounding rocks. Slight interruptions of the mineral-bearing rock are not alone sufficient to destroy the identity of the vein; nor would a short partial closure of the fissure have the effect to destroy the continuity of the vein, if a little farther on it appeared or recurred again, with mineral-bearing rock in it. (*Cheesman vs. Shreve*, 40 Fed. Rep., 793.)

“A vein or lode is a body of mineral or mineralized rock in place within defined boundaries in the general mass of the mountain. (*Cheesman vs. Shreve*, *supra*, and *Stephens vs. Williams*, 1st McCreary, 487.)

“A vein, lode, or ledge (used interchangeably in the mining laws) is a continuous bed of mineralized rock lying within any other well-defined boundaries of the earth’s surface, and under it, and these terms are used in the acts of Congress, as applicable to any zone or bed of mineralized rock lying within boundaries closely separating it from the neighboring rock. It is any class of deposits of mineral matter coming from the same source, impressed with the same forms, and appearing to have been created by the same process. (*Stephens vs.*

Williams, *supra*, and *Iron S. M. Co. vs. Cheesman*, 116 U. S., 534.)

“To constitute a vein it is not necessary that there be a clean fissure filled with mineral as it may exist when filled in place with other matter, but the fissure must be formed and be well defined with hanging and foot walls. (*Cons. Wyo. G. M. Co. vs. Champion M. Co.*, 63 Fed., 540.)

“A lode or vein is a body of mineral or mineral-bearing rock within defined boundaries in the general mass of the mountain. (*Iron Silver M. Co. vs. Mike & Starr, etc., M. Co.*, 12 Sup. Ct. Rep., 543-545.)

“Where well-defined boundaries exist, very slight evidence of ore within such boundaries will prove the existence of a lode.” *Id.*

Numerous other authorities might be cited with respect to what constitutes a lode within the meaning of the mining laws, but it is thought unnecessary to make further reference to them, considering the extended opinion written along this line in the said case of *Henderson vs. Fulton*.

There is no doubt but that phosphate is a mineral and as such may be patented under the United States lode mining laws. Departmental authorities cited already prove this, and no longer make it a question. I submit that the evidence which has been considered in connection with this case, and the report of Mr. Sterling particularly, show that the rock bearing this mineral is in place and has well-defined boundaries in the general mass of the

mountain where it is located, and that it may properly be approved for patent as a lode mining claim.

I recommend that Salt Lake City mineral entries 3923, 3932, and 3934 be approved for patent as lode claims.















